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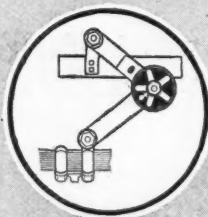
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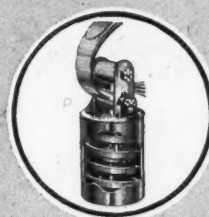
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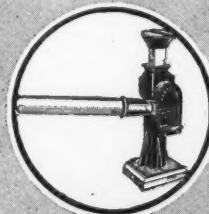
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MOTOR AGE



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No. 21

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WAR, PANIC AND AUTOS

To the making of automobiles there is no end—panic or no panic, war or no war.

I have just come back from Detroit, where they make automobiles almost as fast as Uncle Sam prints postage stamps, and I am infected with the new disease called "auto-optimism." Detroit alone has shipped 60,000 cars in the past two months.

John N. Willys, who is one of the young automobile Lochinvars, has the courage to say that about six hundred thousand automobiles will be made in 1914, totaling about \$600,000,000 of expenditure for autos.

When you realize this is almost three-fifths of the number of automobiles now in use, you can only shudder as you think of the day that is coming within the next few years when pushcart peddlers, messenger boys, book agents and Weary Willies will all own automobiles, for Mr. Willys says that the percentage of buyers who cannot afford to purchase cars is so small as to be unimportant.

Neither wars nor panics disturb the auto market. We must have our autos no matter whether the family purse or the national exchequer goes broke!—J. George Frederick, in ADVERTISING & SELLING, May, 1914.

The automobile industry is today in a more healthy condition, on a sounder, firmer footing, than it has ever been. The "watchful waiting" type of advertiser has consequently very little to wait for in the motor car field. Business is good!

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Motor Age

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MOTOR AGE

TAXI TALES of the American Nights

by J. C. Burton

SEVERAL centuries ago in the oriental city of Bagdad, a resourceful Arabian maiden set a precedent for her sisters of future generations which unfortunately has not been followed. She literally talked her head off. They continue to talk their heads off.

A Princess of Raconteurs

Probably you know of her: no doubt you have read the thousand and one tales of the artful Sheherazade—either as originally set down by the sultan's stenog-

rapher or as blue-penciled by a translator of the Anthony Comstock school—and enjoyed them immensely. Taken by and large, fore and aft and from 12 o'clock midnight until 5 a. m., Sheherazade was some story-teller, a princess of raconteurs, in fact. The way she put her monologue over for 2 years and 9 months without getting the keen-edged hook relegates Joe Welch, Marshall P. Wilder and Lew Dockstader to the supper bill.

But the romantic Bagdad of Sheheraz-

ade, city of many colored domes and minarets, is no more. On the banks of the river Tigris lie the ruins of its once ornate palaces and mosques of glazed tile; the ruins of its fetid khans and perfumed bazaars. The caliph, Harun

al-Rashid, no longer roams its streets at night in quest of victims for his unbridled generosity. Across the Atlantic have sprung up new Bagdads of grim steel and stone with palaces where silk-hatted caliphs wield political scimitars and connive with the descendants of Ali Baba's forty thieves; mosques from which issue anthems of the life everlasting; khans with bars, bell hops, hot and cold running water and telephone in your room and cabaret with your meals; 5 and 10-cent bazaars where the cash registers bear the name of Woolworth. Here hordes of red-nosed mendicants engage in nocturnal perambulations and await the advent of a gullible Harun al-Rashid to stake them to the price of a flop.

Tales of the American Nights

In these bustling Bagdads of the twentieth century, however, the spirit and genius of Sheherazade still lives. Allah be praised! Her art of story-telling has

descended to a host of raconteurs in gray livery; narrators of the tales of the American Nights; Sheherazades of the taxicab flotilla. They honk disrespectfully at Romance, Tragedy and Comedy as they rush over the macadam boulevards of the modern Bagdads. Their ears have shook with sobs and laughter. They weave their tales from the threads of fact. They need imagine nothing. Life lifts her curtain for them. Their stories stay the upraised hand which holds the scimitar of ennui.

Where Tale-Telling Is Rampant

If you would seek them out and draw them out, go to the chauffeurs' room of the taxicab garage. That is where they weave their tales, where they relate their experiences of the past night in the sunless hours of the morning. Compared with the tapestry-hung room where Sheherazade reclined upon a divan and sought inspiration from a hookah, the atmosphere surrounding the raconteurs of the modern Bagdad is anything but conducive to story-telling. The four walls and the floor are of cold gray concrete with clothing lockers on two sides of the room. On one wall is fastened a huge blackboard,

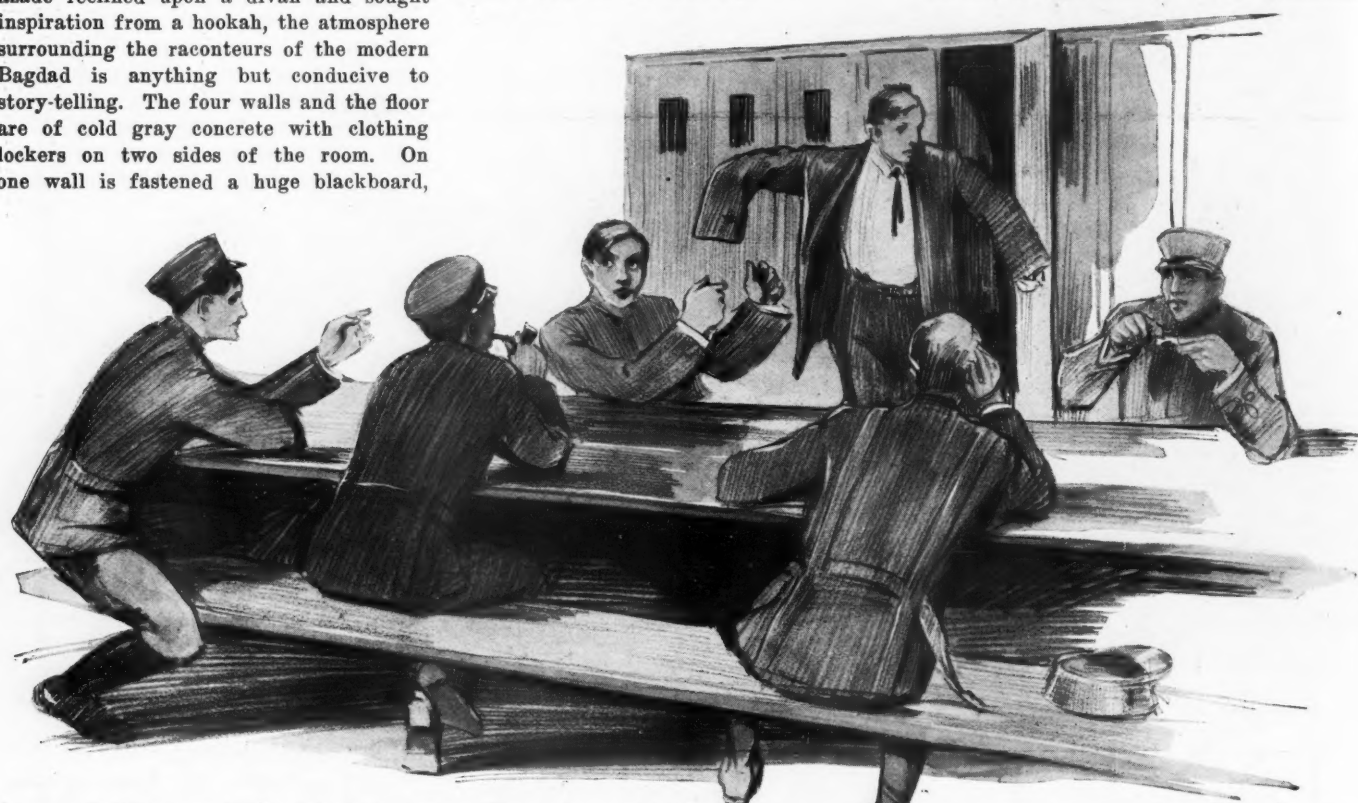
their previous condition of servitude. They come from many nests, these gray birds of the night. That little bundle of nerves that is lighting a cigaret is Johnny Heelan. You guess that he weighs 120 pounds or thereabouts. He tells you that he once scaled at 4 stone and 4. That was when he was answering the call of "Boots and Saddles"; when he rode "Bad News" and "Black Maggie" and "Sister Peggy" at Gravesend and Lantonia and Washington Park; when he wore the bright satins of E. R. Bradley and George Baldwin—Lucky's brother—instead of the somber serge of Walden W. Shaw in Chicago. Johnny is a philosopher. "This is the life!" he declares. "There ain't the money in it that was coming my way when the tracks was open but when you're up on a taxi rig, you're sure of your 15 per and slugs."

facial decoration when they discovered that they lack the artistic wallop.

The studious-looking man who gazes at you over heavy-rimmed spectacles once prefixed the abbreviation "Rev." to his name. Two years ago, when his little church in southern California was destroyed by fire, he brought his family to Chicago. Unable to find a flock to lead in the Illinois metropolis, he accepted as an alternative the guidance of a taxicab. He walks across the room to talk with a driver who formerly tied a white apron about his waist daily and placing his hand upon a brightly polished faucet inquired of customers, "What'll it be, light or dark?"

Melting Pot of All Trades

Continue your questioning and you will discover that the chauffeurs' room is a melting pot for men of varied vocations.



large enough to permit the calculation of the earth's orbit by an advanced mathematician and inscribed with ominous penalties and warnings—"Murphy—discharged for overcharging"; "Schwartz—laid off 5 days for reckless driving"; "Look out for speed cops in Humboldt park." Over in the corner a perspiring negro hums a syncopated accompaniment to the sweep of his brushes. He is blacking the shoes and puttees of the drivers who are about to go out on the early morning shift. Seated on wooden benches before long tables of pine, the modern Sheherazades inhale the smoke of Fatimas and hand-rolled cigarets, play checkers and exchange stories, stories as novel and interesting as the language in which they are told.

If you are disagreeably inquisitive—as I must have seemed—you can learn of

The driver with the cauliflower ears—he is just stooping to tighten his puttee strap—is Eddie Lang. You'll find his name in the pugilistic record book. There also you will find a cryptic notation that partially explains why he is wearing driver's gauntlets instead of 6-ounce gloves. The poignant entry reads: "Jan. 21, 1910, Memphis, Tenn. Battling Nelson, KO by in 8 rds." In the auricular collection in the chauffeurs' room, there is another ear, both cauliflower and receptive, in which Eddie can pour his ring reminiscences when so inclined. Its possessor is Dave Barry, former middleweight, who now acts as starter for the taxicab company at the Lambs Cafe stand. Lounging about the room are several other ex-disciples of Fisticana, championship aspirants who left Professor Bill O'Connell's school of

If you would seek them out and draw them out, go to the chauffeurs' room of a taxicab livery. That is where they weave their tales

Engineers have stepped down from locomotive cabs, policemen have handed in their stars and night sticks, dry goods clerks have discarded their scissors and bank tellers their pens to take the steering wheels of taxicabs. For one driver, a former fire-fighter, the 4-11 alarm rings no more. In the ears of another, a former telegraph operator, the clicking of the fare register takes the place of the dots and dashes of the Morse code. The nimble feet of a third, which earned him \$20 per week and cakes as a soft-shoe dancer with the Broadway Belles Burlesque Co., now rest on the brake and clutch pedals of his traveling multiplication table. Street railway motormen and conductors,

veterans of the horse cab stands, newspaper reporters and a few men who are silent regarding their past have been attracted to this work of continual thrills and flight.

There is talent in the chauffeurs' room. The clear-eyed boy of 20 who is singing in rich tenor "Who Paid Mrs. Rip Van Winkle's Rent When Rip Van Winkle Went Away?" chants on Sundays the Te Deum and the Tantum Ergo in the choir of a Catholic church. Put a Stradivarius under the chin and a bow in the hand of the driver who is hanging his coat in his locker and he will make the instrument moan and cry and laugh for you. The cartoons, which you stopped to look at as you passed through the starter's office, were drawn in idle moments with pencil on scraps of soiled paper by fingers that clutch the steering wheel 12 hours a day and guarantee a safe journey through the crowded loop district of the metropolis.

Five paragraphs aft, I termed these drivers gray birds of the night but wisely attempted no distinct ornithological classification. For the sake of truth, I will go on record as denying that they are doves of peace. They will fight at the drop of the meter flag if a passenger tries to beat them out of a fare. For the sake of justice, I must correct the all too common belief that they are vultures. There was a time when the average taxicab driver was a thug. In Chicago, the good-for-nothing son of the family was wished onto the taxicab company just as in England the black sheep of the house is bribed to enlist in the army. Then came an unsuccessful strike and the thugs were discharged. Honesty and courtesy were demanded of the men who were hired to fill their places. But enough of defense.

"Skirts," "Slugs" and "Chaunceys"

The taxicab driver has a slang of his own. A woman, be she 16 or 60, is a "doll" or a "skirt." A tip is a "slug" or "piece of change" and the giver of the gratuity "crosses your palm." A new man is a "neutral." Aristocratic gentlemen of wealth and family are either "Chaunceys" or "silk hat guys." The Lake Shore drive, Chicago's most exclusive residence district, is known as "Hungry Hollow," because the dwellers along this thoroughfare are famous as "tightwads" when it comes to "palm-crossing." When a driver eats while on duty "he puts on the feed bag." This abridged glossary may serve a purpose all its own, a paragraph or so further on.

By the way, where were we? Now I remember—in the chauffeurs' room of the Chicago company.

Charley, the day boss—rotund of face and chewing an unlighted cigar—enters and with the declaration "Newcomb's

quit" opens the American Nights Entertainment with

THE STORY OF THE DRIVER WHO TURNED SKY PILOT.

When I first put Newcomb's name on the pay-roll, he had all the common or garden varieties of vice. He had already hit the toboggan and was sliding fast.



You will discover that the chauffeurs' room is a melting pot for men of many vocations

W. W. & S.—wine, women and song—was the answer. He had a record for quick jumps from city to city that would arouse the jealousy of a one-night theatrical troupe. He had driven a horse cab in New York, Philadelphia, Boston, Cincinnati, St. Louis, Cleveland, Omaha, Denver, San Francisco and a lot of other burgs that you'll find in the Rand-McNally. In his days of cracking a whip, you could find him at either one of two places—on the seat of a hansom or near the free lunch counter of a saloon. He carried his own headlight. It was his nose.

An Unexpected Reformation

When he first started working for us, I had to call him two or three times for boozing. Once he drew a 5-day lay-off for reckless driving when soused and just as I had made up my mind to tie the can to him, he got wise to himself and braced up. He went on the wagon for good. I found that out one day when I lighted a match near him and his breath didn't ignite. Then he stopped bumming cigarettes and I was jerry that he had quit smoking.

After he had been traveling the straight

and narrow road for about 2 months, one of the boys put me hep to the fact that Newcomb wouldn't take a slug from a drunk. He regarded a rounder's tip as tainted money and when it was offered him, said "Nix!"

I got to wondering how Newcomb was whiling away the hours when he wasn't working. He was never strong for the sleep thing and he was passing up the saloons like there was a smallpox sign on the door. I ought to have had a hunch something was wrong with him when I spotted him the other night standing on the corner of State street getting an earful of Salvation Army music.

Why Newcomb Resigned

Well, he came clean this morning. He threw his money and badge on my desk and cried: "I'm goin' to quit. I'm gettin' too far away from God on this job."

Can you beat it! He's going to run opposition to Billy Sunday and makes his maiden start as a sky pilot down at one of those Clark street missions tonight.

"Well," yawned the Beauty Spot—so christened by the other drivers because he is a reverse English Apollo—as he rubbed his blood-shot eyes, "I know where I can round up a convert for him," and he proceeded to relate

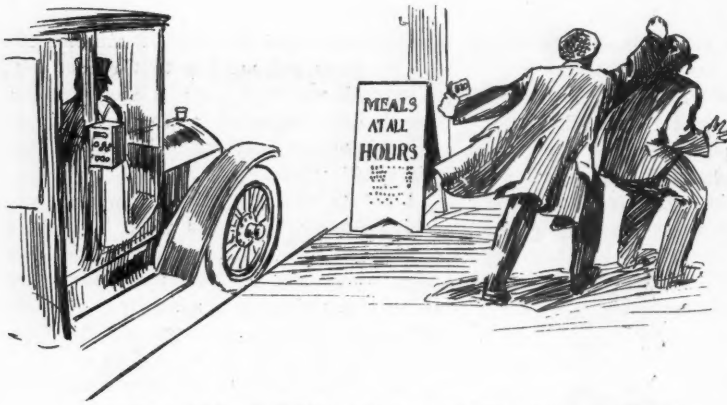
THE STORY OF THE SPENDER AND THE ONE-RING CIRCUS.

For the last 2 days I've been out with a spender from Spendersville, believe me. On the level, to watch him throw good money away you'd think the U. S. mint was turning out dollars for his exclusive use. He ought to have his head examined. He ain't right above the shoulders. Of course I got mine but on the square, it was a shame to take it. I've had a lot of easy-come, easy-go boys out for a joyride but this guy gets the title. He's in a class by himself.

He gets into my cab night before last and told me to give him a whirl about



"I'm going to quit. I'm getting too far from God on this job!"



"Putting dents in Kellies was the best thing this guy did"

town. I hadn't any more than got the engine warmed up and he told me to stop. He gets out right in the middle of the block, walks up to guy, smashes his derby hat and then peels a ten spot off his bank roll and gives it to the other fellow. Take it from me, he had some roll. Putting dents in kellys was the best thing this guy did. It was ride a block or two, stop, fracture a lid, apologize, pay and on our way for 3 hours. I never knew before there was so many good-natured guys in the world. They took the hat-smashing as a kind of a joke or as a good investment, I don't which. How many kellys did he put on the bum? Don't ask me; I'm no adding machine.

A Glutton for Punishment

Along toward morning, he climbs out of the cab and takes the seat beside me. By this time he'd smashed about all the hats in town so he started in to commit assault and battery on my cap. I wouldn't have stood for his rough work a minute but every time he wallops me on the dome, he slips me a V and I'm a glutton for punishment at \$5 per blow. Pretty soon he gets tired of raising a crop of warts on my head, crawls back inside the car and hits the cushions for a sleep off.

"Drive anywhere," he told me when I asked him where he wanted to go. I was headed north and kept on going in that direction. He was still snoring when I gets to Milwaukee and I didn't stop but beats it up the shore line thinking that the lake breeze will do him some good. It must be 2 o'clock before he wakes up and takes any notice of the rube scenery. We ride for another hour and then bump into the tail end of a wagon show. There was six rigs in the outfit and the menagerie consisted of a cage of monkeys, two trained dogs, a bear that was shedding and a troupe of educated fleas. They was on the monkeys and the bear.

This layout had the spender sitting up and taking notice. "How much will you take to put on the

roll. Believe me, he was one game guy!

It was a scream. They pitches the tent in a farmer's cow pasture alongside of the road and puts on the show before the smallest crowd they ever played to and believe me, that circus must have had some pretty bum audiences in its time. Me and the spender gives it the once over for about 15 minutes and then he beats it with me trailing.

John D., Jr., or McDevitte?

"You've got a rotten show," he yells at the circus boss as he makes his getaway. But that bear trainer should bible. What? All the way back to Chi I was wondering whether I had John D. Jr. or John McDevitte out. I'm still wondering.

* * *

The head washer came into the chauffeurs' room just as the Beauty Spot concluded his contribution to the American

circus right now!" he asks the one-ring Barnum that was walking to keep it from getting lonesome.

"Five hundred dollars," was the circus man's comeback.

"You're on," my fare says, reaching for his bank-

Nights Entertainment with a tired yawn.

"Say," he bawled out to the Sidewheeler who cocks his head on one side when he drives "the vacuum cleaner won't never take the spots out of the cushions of your rig. What was doing in your cab last night? Did the ladies of the First Methodist church hold a strawberry festival there?"

"You'd make a swell sleuth, you would," the Sidewheeler declared and added with passionate irony: "Didn't you ever cut your finger? Don't you know blood when you see it, you poor simp!" He waited a moment for the head washer to make profane apologies and then told

THE STORY OF THE BLACK SHEEP'S LAST JOY RIDE

It must have been about 8 o'clock last night when I got a call to beat it over to the Hotel Sherman and pick up a fare. I gives him the up-and-down when he gets into the cab and tells me to take him over to the Union depot. He was dolled up like a Chauncey and looked like a thousand dollars. I had a hunch right away that he was getting over a booze marathon. He was so nervous that if you had put a bottle of milk in his hand, it would have been butter in 5 minutes.

I kinda felt sorry for the poor guy—I've had the booze trembles myself and know how they feel—so I takes the car tracks easy so's he won't get too much of a shakeup. I goes down LaSalle street and was just turning onto Adams when I saw the reflection of a flash in the window behind me and heard the muffled report of a revolver. I looks back as I jammed down the brakes and sees my fare toppled over in the cab with a Gat in his mitt.

"It's no rattler for him," I says to myself. "He wants to go to the morgue." I motions to a cop—I couldn't have called one on a bet—and gives him a free ride west across the river. I must have driven like a neutral. Right here I tell you that I quit the next time a guy does the Dutch act in my taxi. Why, that guy's hand trembled so it's a wonder he didn't hit me.

No Fare, No Flowers

What's the answer? Willie Hearst had all the particulars in the Examiner this morning. It's the old story of the black sheep who was in bad with father and without another punch in his meat ticket. He was wanted for passing phoney-checks.

Am I going to send flowers? Say, I've already contributed. Didn't I have to come across with 60 cents that the meter showed and I never got. That guy didn't have even a jitney on him.

* * *

"I don't feel just right myself



"I looks back as I jammed down the brakes and sees my fare toppled over in the cab with a Gat in his mitt"



this morning," the Nabob declared as he lighted a cigaret of the same name. "I guess my conscience is troublin' me. Sometimes I think I owe the company 20 cents for an extra fare and then again I figure I don't. You see, it's like this," and he began.

THE STORY OF THE HIGH-SPEED STORK

It was just before 12 o'clock yesterday morning when the starter at the athletic club gives me the word to beat it over to the west side in answer to a hurry-up call. About 2 miles across the river on Jackson boulevard I took on a skirt and her husband.

"The Michael Reese hospital and make it fast," he tells me, and I went into high for what I thought was a race with Death. "Somebody's about to take the count," I figures, "and they want to get there before the end." I didn't drive any too careful. It was hit the bumps and step on the throttle all the way and I was driving like Barney Oldfield. Of course, when I gets in the loop, I had to slow down, but I was beating it between crossings and timing myself so I wouldn't be held up at the corners by the traffic cops. I had one hand on the horn and was bumping the crowds that was hurrying to put on the feed bag out of my way.

Frenzied Raps; Strange Yells

At the corner of State and Madison I got the signal to go ahead and was just shifting from second into high, when I heard somebody rapping on the door window. At first I didn't pay no attention to it—I was too busy figuring on the slug I'd get if I made the hospital in time—but when they started pounding again I slowed up and yelled back, "What's the matter?" I didn't get no answer, but something started to cry. It wasn't the skirt and it wasn't the man. I looked back. I had three passengers instead of two. Now what's troubling me is whether I should come across with 20 cents for the extra fare. I didn't charge them for it.

"One of the guys jumped out and grabs the classy-looking skirt and throws her into the bus"

"I mingled with wop society last night and flirted with the Black Hand."

The Bummer volunteered this information while searching in his pockets for the makin's which the other drivers knew from experience was not there. "Got some Bull?" he asked of the Beauty Spot. The Beauty Spot had and tossed a greasy sack over the table. The Bummer extracted a crumpled rice paper from his coat pocket, rolled a cigaret, lighted it and puffed therefrom sufficient inspiration to recount

THE STORY OF THE TAXI THAT AIDED CUPID

I was taking my time yesterday afternoon getting ready to go on the job when Charley calls me into the office and tells me to take my taxi and wait for a fare on the northwest corner of Milwaukee avenue and Des Plaines street.

"It's a 6 o'clock call," he tells me. "A wop by the name of Lombroso ordered it."

I runs across the street to the one-arm hashery and puts on the feed bag in a hurry and makes my getaway about quarter to 6. I hadn't been waiting at the corner of Milwaukee avenue and Des Plaines street more than 5 minutes when two wops come up to me and says: "Is this Mr. Lombroso's car?" When I put them right, they tells me to wait and they climbs inside.

I was taking it easy and smoking a pill when I sees three Italian dolls coming up the street. The one in the middle was strong on looks, that is if you take a fancy to wop beauty. When they was about 10

feet away from the cab, one of the guys jumps out, grabs the classy looking skirt and threw her in my bus. The other guy pulls a gun, points it at my coco and tells me to beat it.

He wasn't any too polite about it but I didn't stop to argue with him. We went about 3 miles through Gault court and the Black Hand district when he told me to stop at an alley. The two guys took the doll out of the taxi and carried her into a saloon.

When the guy with the gun disappeared through the side entrance I decided there was healthier places for me to be than standing by that alley. I didn't waste no time wising up a cop to the kidnapping, and inside of 15 minutes was back at the saloon with three plain clothes men. I whisked those fly mugs all over the stiletto belt. They was looking for clews and the way we stopped at booze emporiums, you'd think they expected to find 'em hiding in the bottom of beer glasses.

Butting in on the Newlyweds

Along about midnight we hauled up before a 2 by 4 jewelry store and pawn shop on the west side. The folks that lived in the rear was having some kind of a celebration. They hadn't sent us an invitation, but we butted in just the same. There was three wops there playing Italian ragtime—maybe it was grand opera—on a harp, a violin and a concertina, and a lot of other guinnies was doing the Mafia tango.

Sure, you've guessed it. The kidnapper and the doll was there. We was about 3 hours too late to pull them-wedding-bells-shall-not-ring-tonight stuff. They'd been

married and was having one last good time before settling down to the matrimonial battle royal.

Couldn't the wop get the skirt without kidnapping her? Now maybe I didn't get it straight, but this is the way I made it out. It seems the doll's old man sold her to another hunkie for \$63.98, or something like that, and the only way this Lombroso guy could get her was to steal her. He'll be singing, "Why did I do it? Why did I do it?" in a couple of days.

Say, that wop wine does certainly stick with a guy, don't it?

"I had the Millionaire Kid out for a ride last night," Johnny Heelan said when the Bummer signified that he had finished his story by rubbing his feverish temples with greasy hands. "There's one lucky guy, all right, all right. A taxi driver 2 weeks ago, a sport today—that's going some."

Of course, I was curious. So in answer to my question: "How came the Millionaire Kid's sudden rise to fortune?" Johnny obliged with

THE STORY OF THE BANK ROLL THAT WENT BEGGING.

We didn't call him the Millionaire Kid when he started to work here. He was the Grouch, and he certainly had that name coming to him. The world to him was a big boil that was growing on his neck. He was always kicking. To hear him rave you'd think nobody ever crossed his palm. "I didn't get even one slug last night," was his regular morning complaint.

Well, about 2 months ago his luck changed. He picked up a fare at one of the downtown hotels that was carrying a load of grape, but was wise enough to know that he'd be an easy mark for a wise crook or skirt. So before he went into a tough saloon, he slips the Grouch a \$1,000 bank roll and tells him to keep it for him until he comes out.

That was about midnight. The Grouch waits for 4 hours and then decides that his fare is sleeping under a table and goes into the saloon to wake him up. He looks around but don't see him. Then he pumps the bartenders and the waiters and they tell him the guy has blew.

The Grouch drives back to the garage and hands over the bank roll to the night boss. The next day the company advertises in all the Chicago papers for the owner, but there wasn't a single reply. After the wad had been reposing in the safe for 2 months, the boss calls the Grouch in and hands the bank roll over to him.

The Grouch quits on the spot. Before he left he changes his name to the Millionaire Kid. He'll be back though. He told me last night he had a sure thing running at Windsor today.

Outside the clang of street car gongs increases in volume. Fully an hour before this, the last milk wagon has clattered by

with its early morning reveille of jangling cans. The great city has already yawned, rubbed its eyes and breakfasted. It is awake and active. A timid sunbeam pierces the window of the chauffeurs' room and dances upon the concrete floor. The American Nights Entertainment is over.

UNCLE SAM WANTS WAR TRUCKS

Washington, D. C., May 15—Secretary of War Garrison today authorized the purchase of seventeen motor truck chassis for use as means of transportation in the quartermaster corps. Sealed proposals for their purchase will be opened simultaneously on May 25 by the depot quartermasters in Washington, Fort Sam Houston, Tex.; El Paso, Tex.; St. Louis, Mo., and Chicago. Truck manufacturers throughout the country have been invited to submit proposals, and it is understood that those in position to make quick deliveries will be given preference in awarding the contracts. The purchase of these trucks is one of the steps being taken by the government to be in readiness in the event of war with Mexico.

TEST SILVERTOWN CORDS

Chicago, May 15—In a recent test conducted by a local branch of the B. F. Goodrich Co. it was shown that the Goodrich Silvertown cord tires add a considerable percentage to the liveliness of the car. With the engine killed, the car was put through a series of coasting tests in Lincoln park. Also it was tested on two steep hills north of Glencoe to get figures on the momentum on an upgrade after coasting down hill. On the latter, with a standing start, reports of the test in-

dicate that the car, on fabric tires, made an average of 13.7 miles per hour over a course 4 mile long.

When these were replaced with the cord tires the average speed was 19.3 miles per hour—approximately 45 per cent increase. The excess distance covered by the cord tires on the down-and-up-hill coasting was 90 feet on an 8 per cent grade. Coasting from a standing start in Lincoln park, the cord tires carried the car nearly twice as far as did the fabric tires. In the Glencoe test the maximum speed from a standing start in coasting was 20 miles per hour with ordinary tires and 26 miles per hour with the cord tires.

BIG ELECTRIC CONVENTION HELD

Boston, Mass., May 20—The second annual convention of the New England section of the Electric Vehicle Association of America and the Electric Motor Car Club of America ended tonight at Bass Point, where a banquet was served to the visiting delegates. It followed an afternoon of outdoor sports that were enjoyed by everyone. The convention was a big success and it was attended by many men interested in the electric field in New England.

FRIENDLY RECEIVER FOR ADAMS

Findlay, O., May 18—W. D. McCaughey, who has been at the Adams Bros. Motor Truck Co. of this city, has been appointed receiver of the concern with a bond of \$50,000. The suit is a friendly one. The company has been doing a good business, but finds the need of more ready cash to prosecute the business.

New Fuel Mark Made by Buick Six

Louisville to Lexington at 38.9 Miles Per Gallon

LOUISVILLE, KY., May 16—Negotiating the entire distance of 82.7 miles without a stop, a Buick six made the trip last Tuesday from Lexington to Louisville on 2 gallons 1 pint of gasoline, averaging 38.9 miles to the gallon. The driver of the car was Horace C. Heisey of the Leyman-Buick Co. of Cincinnati, who piloted the car in the face of a strong wind.

The start was made from Lexington at 9:30 o'clock Tuesday morning, and the trip ended at the city hall in Louisville at 2:10 o'clock Tuesday afternoon. Official observers of the test were Charles C. Swearingen, motor editor of a Louisville paper; James E. Poston of Louisville and Lyman W. Carter of the Lexington Herald. Mayor J. E. Cassidy of Lexington was the official starter. In the presence of the observers he measured the gasoline and placed a seal on the tank. The ruler was then put into an envelope with the mayor's seal upon it.

The run to Frankfort via Versailles was

over splendid roads and against a strong wind, which continued throughout the trip. Between Frankfort and Shelbyville the going was rough.

Eight miles from Louisville a delegation of motorists, headed by Arthur A. MacDonnel and Jack L. S. Cooke of the Leyman company, met the tourists and accompanied them to the city hall, where the seal on the gasoline tank was broken in the presence of the officials and Acting Mayor J. William Miller. The ruler was plunged into the tank again and enough gasoline was poured in to meet the level of the mark made before the start. Only 2 gallons and 1 pint of gasoline were used during the run.

Statements were signed and witnessed in legal form. The names attached to the official paper include those of Mayor Miller and D. R. Lyman, city engineer.

The total weight of the car with the passengers and extra tires was 4,470 pounds; the net weight of the car itself being 3,820 pounds.

France Resurfaces Grand Prix Course

Government Spending \$32,000 on Circuit

PARIS, May 9—Grandstands now are in course of erection, and practically the whole of the 23 miles of the Lyons course are being resurfaced in view of the grand prix race on July 4. The government has decided to spend \$32,000 in removing obstructions and retaxing the roads. It can be estimated, therefore, that the course at Lyons will be the finest possible, for even before this work was put in hand the roads were considered quite up to the average standard of French national highways.

The course is roughly triangular, the point selected for the grandstands being on No. 1 leg, 300 yards from the hairpin turn nearest to Lyons. Trolley cars run to within a few hundred yards of this turn, and the railway line is directly at the back of the grandstands. The natural situation is unique. The stands are on the outside of the course, with the pits on the opposite side of the road. No. 3 leg of the course is on a plateau, and is a dead straight stretch 6 miles in length, terminating in a winding descent down the mountain side. This descent is in full view of the grandstand spectators, and in order that there may be no possible obstruction the sporting commission has rented the whole of the land on the inside of the course opposite the stands.

The cars first will appear in sight at the top of the hill, which is approached from the straight stretch by a sharp right-handed turn. A third of the distance down the hill there is another turn, this time to the left. All drivers consider both these turns very difficult to take. From the second turn there is a straight run to the hairpin, the cars remaining in view of the grandstand spectators except during the few seconds they disappear round the house built on the bend.

As soon as the hairpin is negotiated, the cars will be in view on the grandstand stretch, and as this leg is slightly on the down grade, the machines will have got into their highest speed by the time they pass in front of the stands. The cars will be in view of the spectators for a distance of not less than $2\frac{1}{2}$ miles.

The main stands provide accommodation for 4,000 persons and have a facade of 600 feet. To the rear of the stands a complete town has been erected, the buildings comprising offices, telegraph and telephone booths, cloak rooms, etc. There is accommodation within the grandstand inclosure for 10,000 persons, while cheap places have been reserved in the immediate neighborhood.

Before leaving for America, where he will drive in the Indianapolis 500-mile race, Albert Guyot took out the first of the series of new racing machines built for the French grand prix. Delage has

entered three cars for this event, the drivers being Guyot, Bablot and Arthur Duray. Regulations call for a car of not more than 275 cubic inches, thus the 1914 racing machines are entirely different from those seen at Indianapolis.

Delage has a four-cylinder monoblock engine of 94 by 160 millimeters bore and stroke. There are sixteen valves operated by two overhead camshafts carried in aluminum housings isolated from the cylinders. Ball bearings are used for the crankshaft, and indeed for every part of the motor with the exception of the connecting rods. Very close attention has been paid to the problem of cooling the lubricating oil. The clutch is of the multiple-disk type; there are five speeds and reverse, the fifth being geared up, and bevel type rear axle with drive taken through the forward half of rear springs.

One of the distinctive features of the cars is the use of front wheel brakes. Delage was the first to incorporate these in his car. As soon as the course was announced, Guyot was sent out to examine it and his report was that there were at least fifty turns on which seconds or fractions of seconds could be gained by efficient braking.

It was then that the Delage engineers decided to brake on all four wheels, while retaining the differential brake.

The new cars therefore have five brakes, all of them of big diameter and fitted with radiating fins. This problem of braking front and rear at the same time is a delicate one. Some firms have attempted it and have found it exceedingly difficult to keep the car under control when the brakes are applied.

Guyot declares himself thoroughly satisfied with the Delage application. He can approach bends at a higher speed and stop in a much shorter space than is possible with the use of ordinary brakes. While Guyot and Duray are in America, the Delage trials will be continued by Bablot, the third member of the team, who did not go to America.

The value of this year's racing rules is evidenced by the construction of these cars as fast touring models. Delage, for instance, already has put in hand a moderate series of his 1914 grand prix cars to be sold with a four-seater racy type body. With this equipment they are guaranteed to do 95 miles an hour, and as their taxation is low—for they are considered 20-horsepower cars under European regulation—they use little gasoline and are light on tires, they really are practical machines for road work.

Speed Law of 1868 Declared to be Valid

Fairmount Park's 7-Mile Statute Upheld

PHILADELPHIA, PA., May 16—If there is a law on the statute books prescribing a speed limit of 7 miles an hour within certain specified limits, even if said law is by what may be termed unwritten law ignored on account of its ridiculously low rate and no arrests made for fast driving unless 20 miles an hour is exceeded, persons who drive their motor cars faster than the 7-mile rate do so at their own risk and are even subject to prosecution for speeding. So has decreed common pleas court No. 1, which set aside a verdict of \$9,500 damages obtained by Wesley Rockett from the city.

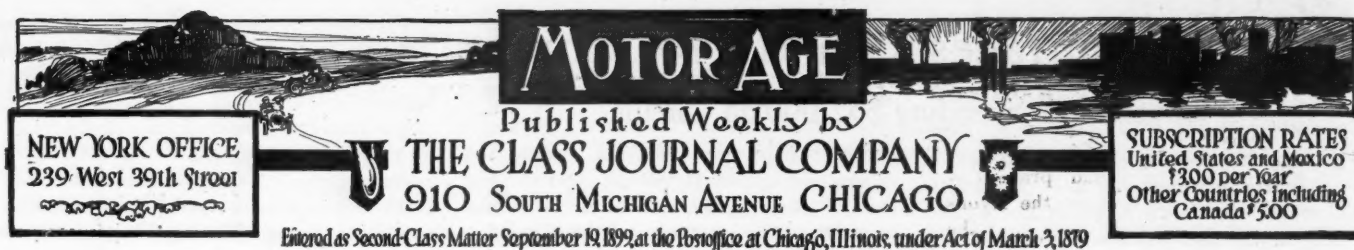
Rockett's wife was killed on Neil drive, Fairmount park, August 9, 1911. The car in which they had been riding collided with a tree which had blown across the highway the previous afternoon during a storm. Rockett contended that the city was responsible in failing to remove the tree or to place sufficient danger lights thereon. He admitted that the car was going at a higher rate than is allowed under the park rules, but contended that the 7 miles an hour restriction was obsolete. This limit was set in 1868.

His counsel insisted that the speed law in question was 46 years old and had become a dead letter with the advent of the motor car, that from the custom of motor cars going from 15 to 20 miles an hour

in the park without molestation from the guards, the ancient act must be construed as of no effect and having no application to motor cars. Several chauffeurs and car owners testified that 20 miles an hour was the customary speed for motor cars and that if machines were held to 7 miles an hour they would become stalled and be unable to take the hills.

Magistrate Harris, who has heard many park speeding cases, also testified that while he had known of the 7-mile rule, the guards made arrests only where cars exceeded 20 miles. He also said that if the 7-mile limit were to be enforced there would not be a motor car in the park. In Rockett's suit against the city the jury agreed with these contentions and he was awarded \$9,500 damages. The city appealed and in reversing the jury's findings the court has entered an order quoting the act of 1868 and setting forth that the testimony that the car which Mrs. Rockett was in ran 18 or 20 miles an hour was sufficient to prevent a recovery from the city for the fatal accident.

It was argued on behalf of the city that as the 7-mile rule had never been repealed or amended, it was still in force, even if not lived up to; the fact that the regulation was framed before the motor car was thought of makes no difference. The court sustained this view.



MOTOR AGE

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Making Motoring Easier

WHAT a change in motoring conditions time has wrought in the last 5 or 6 years. Half a decade ago the motorist almost was a hunted creature and with every man's hand seemingly turned against him. The legislatures were rabid and the motorist was a target for all, with a price on his head. Laws were framed first of all to please the so-called common people and incidentally to fatten the treasuries of the various commonwealths. In the open season for motorists when the legislatures were in session there was no telling what might happen overnight. The motorist was a mark for every aspiring solon ambitious to attract the attention of his constituents to his zeal in their behalf. Now it is a different story. The legislator is a motorist himself. He sees the situation from a different viewpoint and as a result we have sane laws as compared with the measures of 5 years ago. About the only objection to some of the present statutes is the high rate for registration and, judging by the success of Ohio and Mississippi, it will not be long before this is remedied.

FIVE years ago we had no roads worth discussing when we talked with our neighbors across the water. Our touring was restricted to certain parts of this broad domain of ours and there were comparatively few with hardihood enough to venture far into the country. Mention good roads to the average farmer and he fairly frothed at the mouth, imagining that we were trying to pry him loose from some of his hard-earned cash. Now how different. The farmer realizes the benefits of good roads—in fact he demands them as his right and the voice from the rural districts carries to the farthest corners of our legislative halls. The law-maker bows to the farmer and in consequence we now are beginning to get the roads that we need.

ONE can also look back to the time when other motoring conditions were hard and rigorous. It was not enough that we had offensive legislation and poor roads but we also felt it when we came into intimate contact with our cars. We had to crank the motor ourselves, we had to struggle with refractory tires; we had to suffer the inconveniences of oil lamps; bump over the rough roads on cars with poor springs and we had many other troubles, which now have been forgotten. With self-starters, demountable rims, electric lighting, automatic gearshifts and the like we almost are approaching the motor millennium.

WE are rapidly approaching one more luxury, one whose benefits are beginning to be appreciated—the power tire pump, and it is predicted by more than one manufacturer that it will not be more than a couple of years before this appliance will become part of the regular equipment of every standard motor car. The power pump, they say, will win over to motoring many a man who now fights shy because of anticipated tire troubles. It is not the actual work of changing a rim or even a tire that the average motorist minds, but it is the back-breaking labor of having to inflate the tire by hand after he has made the change. Usually he does a slipshod job, too, because of weariness. He puts in about 40 pounds of air after much effort, then concludes he has enough to carry him to the next garage. Maybe he brings up the pressure there and then again maybe he does not. But the running on the comparatively soft tire has its effect in later blowouts. Therefore, it would seem that it is a logical conclusion that when the use of the power pump does become more universal then we will have taken one more step in the right direction and have made motoring still easier.

Why Not the British Way?

THE used car continues to be the Old Man of the Sea of the American motor industry and bids fair to continue to be so for years to come. Admittedly the main fly in the motor ointment, what to do with it is one of the greatest problems that confront our manufacturers and dealers. Of course the latter is more directly involved than the maker, but the former must of necessity bear with the dealer, his middleman. If the dealer is loaded down with old cars taken in trade then the manufacturer finds his market curtailed. Various and sundry methods of getting rid of this drag on the industry have been evolved and tried without success.

STILL the Old Man of the Sea continues to enjoy his ride on the shoulders of the motoring Sinbad who struggles along as best he may, always realizing his burden and seeing no immediate relief in sight. And so perforce we turn our eyes to Europe and wonder what our cousins in England do. Investigation shows that they are not worried thusly, and why? Because they refuse point blank to trade. The owner looking for a new machine first must sell his old one or else dispose of it to a second-hand dealer. The English manufacturer and dealer are making and selling new cars and not old ones. They realize the necessity of keeping aloof from the used machine and they have profited accordingly.

OF course on this side of the water we have run so long in the same rut that it is hard to turn out of it without skidding, but surely there must be some sort of an anti-skid that will hold us when we do swing. Look at the other industries, for instance. Do we turn in our old furniture to the furniture man when we are restocking the establishment? No, we either give away the old stuff or we sacrifice it to the second-hand dealer. Does our tailor take our old clothes in trade for new ones? Or does the jeweler load himself up with old-fashioned watches and clocks or does the shoe man attempt to resell the old boots and shoes that his customers may want to dispose of before buying new footgear? Again no. These other industries have solved this most important problem most effectually. Why cannot this same principle apply to the motor car business?

IT would be ideal, would it not, if the majority of the buyers first of all sold their own cars before calling on the dealer and talking of a new one? Why is it not a logical course? It would take salesmanship on the part of the owner, mayhap, but if he could go into court with clean hands, as our lawyer friends would say, he would find the dealer in motor cars in such a healthy financial condition that it would be better for all parties concerned if a trade deal was not involved.

Wood Plaster Used in Body Building by the French

Curves and Intricate Forms Made Easy by New Method

A FRENCH inventor has developed a type of wood plaster which can be put on any surface in the same way as a plasterer puts his material on a wall, a ceiling or a panel, and gives the same facility for obtaining curves or intricate forms. The application of such a material is of course extensive. It is particularly useful in household construction, for it allows a wood finish to be given without the use of planks. The same invention has been applied to motor car body construction, allowing the most difficult curves to be obtained with ease and abolishing all joinings.

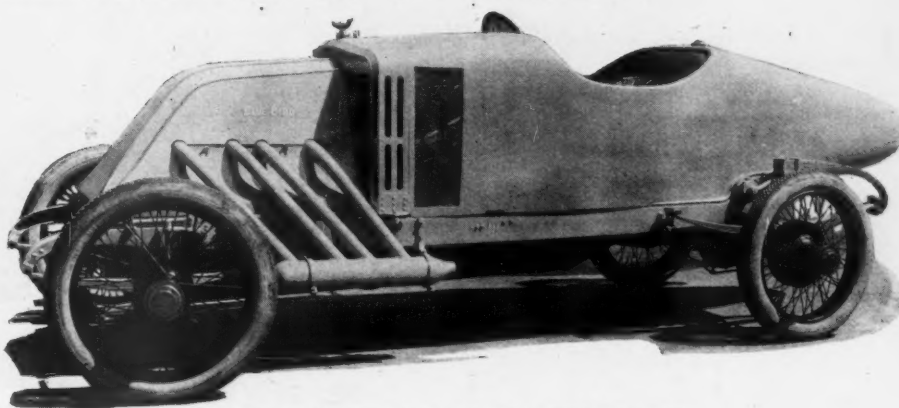
There is nothing special in the frame construction, which is built up of wood in the ordinary way. Instead of receiving sheet steel or aluminum panels, this frame has nailed over it wire gauze panels which are shaped by hand or with a hammer, as desired. The wood cement is prepared separately, its composition being kept a secret. It is laid over the wire netting with a trowel, the thickness being not more than 5 millimeters, and is smoothed off in exactly the same way as plaster is smoothed.

When the wood plaster has dried, it can be finished with sandpaper or pumice stone and is painted in the same way as wood. It is possible to mix the coloring matter with the plaster. This material is absolutely incombustible; it will receive screws and nails as readily as wood, and it will adhere to the wire netting ground work much more effectively than cement will adhere to a wall. It is declared that weight is low, although definite information on this point is not supplied. Bodies built of this material are not sonorous.

One of the first car bodies produced according to this system is a two-seater racing type on a Charron chassis. The body has a very long almost round section tail. The tank is carried within the body at the back of the seats, and immediately behind this is a locker with a hinged door. The entire body is built up without a seam, a result which would be practically impossible with any other method of construction.

ROW OVER MAINE HIGHWAY

Boston, Mass., May 18—A row has developed over the proposed road between Portland and Math, and politics has mixed itself in so that there is a possibility now that the matter may fall through. When the road was planned the national government appropriated \$65,000 to help the highway along and Maine added \$130,000, making a total of \$195,000. The federal government insisted that some material other than gravel be used and so an agreement was reached to use bituminous macadam. But the money appropriated



WOOD PLASTER BODY ON CHARRON CHASSIS

would not be sufficient for the entire road and so it was understood that the highway should be started this year and finished as far as the funds permitted.

Congressman McGillicuddy has taken a hand in the matter now and he insists that the road be constructed clear through to Bath this year, for the part between Brunswick, where it was proposed to stop until next year, and Bath is in his district. He was instrumental in getting federal aid and so he insists on his plan. The only alternative would be to start at Bath and come east to Portland, but the government planned it the other way. Moreover, many motorists enter the state near Portland and the road would be a benefit at the gateway more so that at the other end. So the matter is now up in the air.

It also is said that owing to existing conditions along the route it would not be possible this year to build that portion of the highway. Richmond has not voted on the question of a bridge yet, and there are other difficulties in the way.

NEW AMPLEX CONCERN FORMED

Indianapolis, Ind., May 18—Harold M. Pulsifer, E. J. Gulick and R. W. Randall, who some time ago purchased the assets of the Amplex Motor Car Co. at Mishawaka, have just received a charter from the Indiana secretary of state for the Amplex Mfg. Co., under which name the business is to be operated in the future. The new company has an authorized capitalization of \$200,000 and a line of medium-priced motor cars are to be manufactured.

French Strive for Gasoline Economy

Fuel Cost Decides Recent Test

PARIS, May 5—Economy in fuel and oil consumption and in tire wear constituted the basis of awards in the 2,000-mile light-car tour round France which has just come to a close. Each car was allowed one spare tire and one spare tube, these together with the tires on the wheels being stamped at the outset of the competition. Tanks were filled and sealed at the beginning of each day's run. In making awards economy was the only consideration, the result being worked out to the average cost per 100 kilometers or practically 62 miles. There being five distinct classes, there are naturally as many winners. These classes vary from 67 cubic centimeters cylinder capacity light cars to 183-cubic inch cars. Gasoline was calculated at the rate of 48 cents a gallon.

A little four-cylinder Alva in the 91 cubic inch class, showed the lowest cost, carrying two passengers a distance of 2,000 miles without being late on any control, at a cost of 78 cents per 62 miles. In the 183-cubic inch class a four-cylinder His-

pano-Suiza capable of more than 60 miles an hour, had a fuel cost at the rate of \$1.56 cents per 62 miles. The following is the list of awards:

67 CC. MAXIMUM		
Pos.	Car and Driver	Cost per 62 miles
*1	Automobilette, Colnet.....	\$0.81
*2	Ch. Fournier, Pesse.....	\$0.82
*3	Autorette, Guerry.....	\$1.61
67 CC. TO 91 CC. MAXIMUM		
1	Ponette, Grandvaud.....	\$0.94
*2	Gep, Pons.....	\$0.90
*3	Sigma, Dutel.....	\$0.97
*4	Automobilette, Chabot.....	\$1.01
91 CC. TO 122 CC., MAXIMUM WEIGHT 2,200 POUNDS		
1	Alva, Rassaut.....	\$0.78
*2	Majola, Senart.....	\$0.80
122 CC. TO 152 CC., MAXIMUM WEIGHT 2,200 POUNDS		
1	Aquila-Italiana, Mathis.....	\$1.06
2	Scap, Genault.....	\$1.23
3	Fax, Paul.....	\$1.28
4	Humber, Mora.....	\$1.44
152 CC. TO 183 CC., MAXIMUM WEIGHT 2,200 POUNDS		
1	Scap, De Fommervault.....	\$1.07
2	Hurtu, David.....	\$1.08
3	Diatto, Matthys.....	\$1.09
4	Arrian, Renard.....	\$1.14
183 CC. TO 200 CC., MAXIMUM WEIGHT 2,200 POUNDS		
1	Hispano-Suiza, Abit.....	\$1.56
*Penalized for late arrival on control		

French Cars Early Favorites for Indianapolis Race

Americans Fear Peugeots in 500-Mile Event Next Week

INDIANAPOLIS, Ind., May 19—Special telegram—If early predictions are verified 10 days hence France will repeat its 1913 triumph in the fourth annual international sweepstakes to be run on the Indianapolis speedway Memorial day and the National's 1912 record of 78.74 miles per hour will be shattered when the checkered flag flecks the hood of the 1914 victor.

Ten days before the running of what promises to be the most spectacular 500-mile race in the history of the Hoosier speed classic, the Peugeot team rules a decided favorite because of the prestige won by Jules Goux in last year's contest and the sensational showing of Georges Boillot, his teammate, and his fleet blue car in practice this week.

Hold Peugeot in Awe

In the camps of the American defenders there is lugubrious skepticism. This may be dissipated by the first of the week, but at the present time the feeling is common that the race already is won as far as the Peugeot drivers are concerned and that nothing short of a miracle can prevent either Goux or Boillot from returning to Paris with the lion's share of the prize money and speed honors.

It is certain that the Peugeot drivers did not cross the Atlantic with any other idea than to repeat their victory of last year. The blue cars are conceded to be the fastest in the field of forty-five starters and they look to be able to stand the gruelling test to which they will be put a week from Saturday. Since coming to Indianapolis, Goux and Boillot have had little to do except to try out the track, regulate their gearing and test tires. That they are confident of victory there is no doubt.

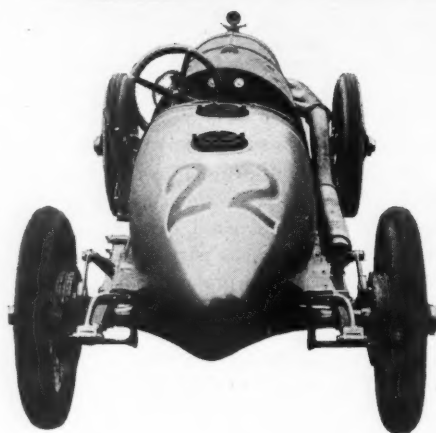
Psychology will play a part in the 500-mile race of 1914 and to date it has allied itself with the Peugeot pilots who have got the goat, ibex, hollow-horned ruminant, or whatever they call it in that dear Patee, of the American drivers. Goux and Boillot have a habit of waiting until their rivals get out upon the track and then give chase and pass them with seeming ease. In the ears of the Yankee contestants, the Peugeot motors sound an arrogant note and the confident smiles of Goux and Boillot are translated as sneers.

Boillot's record lap of last Sunday afternoon, when he made a circuit of the track in 1 minute 35 1/2 seconds or at a speed of approximately 95 miles an hour, only has served to intensify the gloom among the Americans and more firmly entrenched the Peugeot in its position as favorite. Before Boillot ran wild day before yesterday Joe Dawson and the Marmon boasted of the fastest practice lap, 1 minute 36 1/2 seconds. Joe swept around the



TWO OF THE MERCERS

The above illustration shows Caleb Bragg in one of the big Mercers. The other shows a rear view of Pullen's Mercer. Pullen's car is somewhat different from that of his teammates, being of 299 cubic inches piston displacement, while the others are 445 cubic inches. The body also is different, in that it has a decidedly streamline cigar-shaped effect. Another way in which the cigar-shaped Mercer differs from the other Mercer racing cars is in its left-hand drive. This is the first time a Mercer has been tried out with left control.



curves with the throttle wide open. Boillot, on the other hand, rolled the turns, shutting off before he went into the embankments.

The American cars now at the speedway have yet to show the speed of the blue invaders from across the Atlantic. They are not as well prepared at the present time as are the Peugeots. The Mercers now look to be the class of the Yankee entries, Spencer Wishart making the best time in sustained trials of any of Uncle Sam's defenders. The Stutz entries can be counted upon to put up a splendid battle from starting bomb to checkered flag but they have not as yet shown the speed that they will have to maintain in order to fight the Peugeots hood-to-hood and wheel-to-wheel.

Harroun Will Not Drive

Two of the Maxwells, the mounts of Carlson and Tetzlaff, are being tuned up daily but whether or not they will be dangerous contenders is a much-mooted question. Ray Harroun's speed creations generally are regarded as experiments to be respected, but the regret is common that the former Marmon driver did not have more time to prepare for such a crucial race than he has had. The third Maxwell entry has not been shipped to the speedway but it is expected that it will arrive the later part of this week. No driver for this car has been selected as yet.

One thing is certain—Harroun will not play the role of a come-back, all outstanding rumors to the contrary not excepted. Ernie Moross, the Maxwell manager, has not given up hope of having Hemery at the wheel, but in the meantime is dickering with several other drivers, including Charlie Merz, who won third money with the flaming Stutz in last year's race and who is at liberty this season. If neither Hemery nor Merz accepts Moross' terms, Bob Burman's former manager probably will select his third driver from the fourteen unfortunate pilots whose cars will be eliminated in the qualifying trials of next week.

All Foreigners Report

Eight foreign drivers have now taken temporary residence at the speedway, Goux and Boillot and Ernest Friedrich, the Bugatti pilot, having been joined by the five other invaders this afternoon. The troupe of alien stars certainly looks formidable. Jean Chassagne, holder of the world's hour record; Arthur Duray, who traveled at the record speed of 142.9 miles an hour at Ostend last December; Albert Guyot, who will drive the Delage in this year's 500-mile race; Rene Thomas, his teammate, and Josef Christiaens, who will carry Belgium's colors this year, arrived at 2 o'clock this afternoon and were taken directly from the station to the brick oval. They were accompanied by W. F. Bradley, foreign representative of the speedway and Paris correspondent for Motor Age, who is acting as their business manager and interpreter. Their cars, the Sunbeam, Peugeot, Delage and Excelsior, were shipped to the course sev-

eral days ago and the foreign drivers will make their practice debut tomorrow morning.

Carl Fisher, president of the speedway, has rescinded his anti-castor oil ultimatum promulgated last week when he announced that this substance could not be used as a lubricant in this year's race, because of its disagreeable odor. The lateness of the day prompted him to reconsider his decision. He found that many of the cars reporting at the track had been especially built to use this lubricant and decided that such an order would work a hardship on some of the entrants.

Notwithstanding the report that several of the entrants had threatened to enjoin the management provided their cars were not allowed to start after being eliminated in the qualifying trials, the speedway management today announced that only thirty cars would be sent away by Starter Hay. They claim that there is no chance to misinterpret the ruling covering this point in the official entry blank which reads as follows:

"Only thirty cars will be allowed to start. In the event more than thirty cars are entered after three-car teams have been reduced to two cars each, the thirty fastest cars in a speed trial of one lap of the track will be eligible."

The elimination trials will start at noon Monday and will be continued Tuesday and Wednesday. Drivers may qualify at their own discretion, but no car will be timed after Wednesday afternoon. Referee Pardington, David Beecroft, special representative of the A. A. A.; Harry Knepper, chief timer; Starter Tom Hay, and F. E. Edwards, chairman of the technical committee, are expected in Indianapolis by Monday morning at the latest to take charge of the qualification trials which begin that day.

Three additional drivers have been named for cars which were without pilots when entries were filed. Willie Haupt will pilot the second Duesenberg, Guy Ball has accepted terms to handle the third Great Western and Fred Melaun, a dirt track campaigner who formerly traveled with Oldfield, will be at the wheel of the Titze.

The following cars and drivers already are at the track: Burman, Burman; Stutz, Cooper; Stutz, Oldfield; Gray Fox, Wilcox; Beaver Bullet, Keene; Peugeot, Goux; Peugeot, Boillot; Maxwell, Tetzlaff; Sunbeam, Chassagne; Delage, Guyot; Excelsior, Christiaens; Peugeot, Duray; King, Klein; Delage, Thomas; Mercedes, de Palma; Mercer, Wishart; Mercer, Bragg; Mercer, Pullen; Stutz, Anderson; Maxwell, Carlson; Marmon, Dawson; Sunbeam, Grant; Keeton, Knipper; Texas, Clark; Bugatti, Friedrichs; Pope Bullet, Roberts; Ray, Brock, and Isotta, Gilhooley.

Jenkins and Price, the Great Western drivers, are at the factory working on their cars and will not ship from Peru until the latter part of the week. Neil

Whalen may be substituted for Gilhooley on the Isotta. No. 50, the unknown, will be withdrawn, provided its builder cannot get it ready to send to Indianapolis by Wednesday of this week.

A record crowd will witness the Memorial day classic if the advance sale of seats is any criterion. High priced reservations are 30 per cent ahead of those made last year and the speedway officials expect that 100,000 race fans will worship at the shrine of the great joss Speed a week from Saturday. Ten thousand persons can be accommodated in the new stand built this spring.

An addition to the prize list was made this week when the Champion Spark Plug Co., of Toledo, announced offerings of \$500 for first, \$250 for second, \$125 for third, \$75 for fourth and \$50 for fifth for those who use Champion plugs. Louis Chevrolet will be at the race to represent the Champion company.

Clarence N. Peacock & Co., exclusive licensees of Ames equalizing spring, a device for absorbing shock and protecting springs against breakage, have posted with the American Automobile Association prizes to the amount of \$500—\$250 to the driver winning on Ames equalized springs; \$150 to second and \$100 to third.

FORD CUTS ANOTHER MELON

Detroit, Mich., May 18—It is reported today on good authority that the Ford Motor Co. has just declared an extra cash dividend of 100 per cent or \$2,000,000. This is done at this time because it is

the eleventh anniversary of the formation of the company, it is said. Henry Ford, with 58.5 per cent of the 20,000 shares of stock, receives \$1,170,000 of the sum given out, while James Couzens, with 10.9 per cent, gets \$218,000. The other six stockholders share as follows: John F. Dodge, Horace E. Dodge, Horace H. Rackham and John W. Anderson, each holding 5 per cent, each receive \$100,000; David Gray estate, holding 10.5 per cent, draws \$210,000; R. V. Couzens, with one-tenth of 1 per cent, receives \$2,000.

Last year's anniversary dividend was \$10,000,000 at this time on the capitalization of \$2,000,000. Besides this dividend each year, the stockholders enumerated draw quarterly dividends of 15 per cent, or \$300,000.

NEW STOCK CAR BLANK

New York, May 20—Special telegram—The contest board of the American Automobile Association has adopted a new form of stock car certificate for use by technical committees in checking the status of stock cars in reliability and economy contests. This replaces the old stock certificate of description which went much further into detail in order to cover possible rebuilding of car for speed contests.

The new certificate which is but two-thirds the size of the old one is in the form of single 8.5 by 11-inch sheet and covers the outline specifications of the car and gives sufficient data to fully cover its purpose of non-speed contests.

National Fuel Test of the Saxon Car Average of 34.75 Miles Per Gallon Made

DETROIT, Mich., May 18—An average of 34.75 miles to the gallon of gasoline was the record made by Saxon cars in the 200-mile Saxon non-motor stop contest for dealers May 16, according to the first batch of reports to be received. In this contest 180 Saxon dealers entered from all sections of the country. Each of the competing cars was driven 200 miles without stopping the engine, a total of 36,000 miles in non-stop service under all conditions of roads and weather. Each driver was accompanied by a newspaper man who acted as observer and checked the amount of gasoline consumed.

The average mileage scored was at the rate of less than $\frac{1}{4}$ cent a mile for fuel for each passenger. Where conditions were most favorable, as in New Rochelle, N. Y., Des Moines, Ia., and Webb City, Mo., an average of better than 47 miles to the gallon was secured. Despite heavy rains, muddy roads and steep hills in some territories, all but six of the contestants did better than 30 miles to the gallon. The lowest score made by a Saxon was 26.7 miles per gallon.

Reports show also that an average speed

of 20.9 miles an hour was maintained by the Saxon throughout the run. One dealer averaged 27.6 miles, and another on a short speed test managed to get his car up to 43 miles an hour.

A. C. A. WAKING UP

New York, May 19—The Automobile Club of America will hold a club run for the P. M. Brotherhood trophy, to Lake Ronkonkoma via the motor parkway on May 23. This is the first run held by the club in over 5 years. The route will be by way of Hoffman boulevard and Hillside avenue to Hillside avenue lodge, Rocky Hill road, Jamaica, where the motor parkway will be entered. In case of rain the run will be held on a later date.

The conditions of the run are as follows: The cars will be checked out from the Great Neck Lodge, between 11 and 1:30 a. m., at stated intervals, and the trophy will be awarded to the driver who passes a secret time control on the motor parkway nearest to an average rate of miles per hours given each car by the committee, the driver having the option of choosing a 20, 30 or 40-mile average.

Late News Happenings in the American Motor Industry

Report on United States Tire Co. Business

NEW YORK, May 19—No additional financing for this year will be done by the United States Rubber Co. The money required to carry this company's stock of crude rubber is greatly reduced, as crude rubber now is selling at 60 to 70 cents a pound, compared with \$2 a pound 2 years ago. The funds required to carry its manufactured goods also is correspondingly reduced.

In 1918 the company must take care of \$15,000,000 of debenture 6s, which fall due of an original issue of \$20,000,000. Those interested in the company state that the company will be able to take care of all needs until these bonds mature.

During April tire sales increased 21 per cent over a year ago. The company now is manufacturing 6,000 tires a day as compared with 4,500 a year ago. This means the present working of plants at capacity. By June 1, when the capacity of the Morgan & Wright plant at Detroit will be increased, it is expected that the company will be able to put out 7,000 tires daily.

The general tire industry in the United States for the last quarter of 1913 and the first 3 months of the present year showed a slowing up. Decreased tire sales account for the last quarterly dividend of only 3 per cent on the common stock of the Rubber Goods Mfg. Co., as compared with a 6 per cent dividend at the same period in 1913 and 1912. The Rubber Goods Co. owns the United States Tire Co.

The United States Tire Co. is carrying close to \$10,000,000 cash, or approximately the same as at the close of 1913. On the other hand, current liabilities have been considerably reduced as compared with the showing in this respect in the balance sheet as of December 31, 1913. The company has 35,000 acres planted in rubber trees in Sumatra. It owns 50,000 acres additional on the island on which rubber trees will eventually be planted. It is estimated that these plantations will save the company a half million dollars on its crude rubber bill.

HENDERSON LIQUIDATING

Indianapolis, Ind., May 18—Announcement is made that the friendly receivership which was brought about last week through a suit filed by W. C. Mock of the Hydraulic Pressed Steel Co. of Cleveland is but the first step in winding up the affairs of the Henderson Motor Car Co. Liquidation rather than future losses is the policy adopted by the Hendersons, who, after paying all accounts as far as possible without court action, will apportion the assets of the company. A statement issued by the company says:

Last September the Henderson company was confronted by an accumulation of current mate-

rial bills, which together with the sudden slump in sales and existing financial stringency forced it to place its business on a strictly cash basis. However, since September, the Henderson company has made a very creditable record, in that more than 85 per cent of the parties appearing as creditors at that time have been paid cash in full. Less than 15 per cent of the creditors at that time now appear as such.

This 15 per cent, approximating some forty accounts, have been paid 20 per cent of their accounts in cash, and doubtless will receive an additional payment as there are no contingent liabilities of importance other than the accounts mentioned. All accounts contracted since last September have been paid for in full by cash, and practically all deposits have been returned to dealers that were entitled to them.

In the meantime, the Henderson company by continuing its operations has used and paid for large quantities of material that was in process of manufacture and to this extent relieved the various accessory manufacturers.

Regardless of the creditable things that were accomplished by the Henderson company in the way of paying accounts, the recent financial depression and the accompanying hold-up in business throughout the country has made it next to impossible to obtain sufficient outside capital to warrant the hope of continuing the business with ultimate success, so rather than dissipate the assets, and after several friendly conferences, they decided to discontinue the business and have the assets apportioned among those to whom money is owing.

By paying the creditors in cash as above mentioned, the Henderson brothers, who were the principal owners of the business, sustained the major portion of the loss, and although a suspension of their business is to be regretted credit is due them for the honorable methods that they pursued to save others from financial losses.

MAY AUCTION P. & S. ASSETS

New York, May 19—Although several bids, for the property of the defunct Palmer & Singer Mfg. Co., Long Island City, N. Y., including one from the Singer Motor Co., were opened today by Referee in Bankruptcy Charles A. Tipling, it is unlikely that any of them will be accepted by Trustee Charles A. Wadley. This means that the property probably will be sold at public auction at the date originally set, which is Friday, May 22. The property to be sold includes machinery and material on hand and in storage, office furniture and fixtures, patterns, drawings, models and dies.

MARATHON CLAIMS SOLVENCY

Nashville, Tenn., May 18—Involuntary bankruptcy proceedings against the Marathon Motor Works of this city were instituted Tuesday by the Ohio Top Co. of Cincinnati, the Ross-Meehan Foundry Co. of Chattanooga and the Driggs-Seabury Ordnance Corp. of Pennsylvania, representing an indebtedness of \$11,235.

This court action has been followed by a denial from the company, which claims that it is solvent and that the court proceedings were brought about by a former officer of the corporation who had been discharged.

"An involuntary petition in bankruptcy has been filed by three creditors, the Ross-Meehan Foundry Co., Ohio Top Co. and the Driggs-Seabury Ordnance Corp.," says the company in a statement. "The Ross-Meehan Foundry Co. and the Ohio Top Co. now are making efforts to withdraw their part of this petition, as this com-

pany was not indebted to either concern at the time the petition was filed. The Driggs-Seabury claim has been in litigation for 2 years. Our assets exceed our liabilities by \$500,000 and we never have been in better financial condition. We propose to fight the bankruptcy proceedings to the limit. Our total indebtedness to the parts people will not exceed \$10,000, none of which is past due."

Following this statement, the Herff-Brooks Corp. of Indianapolis, handling the Marathon output, went on record by stating: "The Marathon affairs never have been in better financial condition. We know their assets exceed their liabilities by \$400,000 or \$500,000. We will continue to handle their product and our business in Marathon cars is good."

HEFTLER ASSIGNS A PATENT

Washington, D. C., May 15—Under date of May 12 patent No. 1,096,626 to Victor R. Heftler assigned to the Zenith Carburetor Co. has been issued. This patent covers a device which the Zenith company added to its line specifying a scheme for easy starting. In this arrangement there is provided a channel for the gasoline from a well between the intake and the float chamber by means of which when the throttle is closed the suction falls directly on the gasoline, providing a rich mixture.

NEW LOCOMOBILE OUT

New York, May 15—The 1915 Locomobiles have been shipped to the branches throughout the country and are on display now. The chief change in the Locomobile policy for this season is the dropping of the right-drive models and incorporating many detail refinements and luxuries in a development of the streamline body. The entire line of cars is built on two chassis known as the Little Six 30 and the Big Six 48. The larger and heavier bodies are mounted on the larger chassis.

The chief refinement is to be found in the application of the Westinghouse starter, which is used in connection with a control which is the product of the Locomobile engineers. As far as the drive is concerned the starter is operated by a push button, making the starting operation as simple as switching on the headlights. In fact, all the electrical push buttons look alike, being placed in a vertical row on the dash and within reach of hand or foot. The starter button is the lowest of the vertical row. As soon as the starter button is pushed the electric motor is engaged with the flywheel by means of a solenoid and remains there until the button is allowed to return to its normal position.

All the electric buttons can be locked

in any desired position by a Yale key and additional convenience is secured by having the same key for the bonnet, tool boxes and tires. Better material is used throughout the car than ever before. Drop forgings are used for small parts such as spark and throttle levers, windshield bracket, and bonnet clips. The top has been improved, having a lining which covers all the structural parts, such as the bows, and a better type of fastening device which holds the top in place against the windshield by means of a ball detent. A visor prevents any top draft. When the top is collapsed a new design of bow fastener holds them firm and rubber inserts prevent rattling or marring of the lining.

In the interior work considerable improvement has been made in a decorative way. The dash layout is neater and the cowl is provided with a leather lining. The fenders are more heavily crowned and are made in one piece. The brakes are 2 inches larger in diameter and operate on two separate drums. The tread is 56 inches instead of 54.5. In the body work a beautiful adaptation of the streamline is given.

SLACK TIME AT FORD PLANT

Detroit, Mich., May 18—The slack season, which, it is pointed out, comes about each year in the regular course of business with any big corporation, has arrived with the Ford Motor Co. which for several days past has been laying off from 200 to 300 men a day as a result. This is a 30-day suspension and the procedure is expected to continue until from 5,000 to 6,000 men have been temporarily dispensed with.

The plan is in line with the sociological work of the Ford company, one of the head officials stated today. The undesirable are being weeded out. All have been given since the first of the year to show whether or not they had it in them to reform and improve, and those who exhibit no inclination to better themselves are the first to go. The movement for elimination of the weak ones will thus put the working force in ship-shape condition. No curtailment of the schedule of production is contemplated, the lessened force merely being more efficient per man and, thus with fewer better men the same work is accomplished that was formerly done with a much larger force of less efficient forces.

The Ford company, in laying off some of its men assures them that in the event they are not able to find work after a 30-day idle period, it will do what it can to assist them to find work. Each man's condition is to be fully investigated before he is laid off, and those without families to support will be the first to go. Married men measuring up to the standard of efficiency which has been set will be retained as long as it is consistent for the company to do so. On May 16 the

following bulletin was posted at the big plant:

"In the regular course of business we have reached the slack or quiet season. In line with our policy to be just and fair to the individual employe, we have planned as follows: Employes will be given a leave of absence, without pay, or, if you please, laid off for a period of 30 days. If, during the leave of absence, or lay-off, the employe can find other employment, the company recommends that he do so. If, at the end of 30 days our men have found no other employment and desire to return to work, they may apply and the company will endeavor to find employment for them."

TEMPORARY WIN FOR MOTOMETER

New York, May 18—Manufacture and sale of the Stewart-Warner radiator thermometer was temporarily stopped Saturday by Judge Hand in the United States district court in New York city. The court held that it would interfere unjustly with the business of the Motometer Co., Inc., which is marketing its device, the Motometer, under patent No. 1,090,776, granted March 17, 1914. The injunction, however, is preliminary and is to stand only during the pendency of the suit which recently was filed by Harrison H. Boyce and the Motometer Co.

The Motometer Co. claimed that knowledge of its business and its device was unfairly secured by Stewart-Warner; that the Stewart-Warner device, which registers by a needle, is an inferior product and that the proposed price of \$5 would wreck the business of the Motometer, which gets \$10 for its devices.

A principal point at issue was as to the efficiency of a radiator thermometer which does not project down into the water but registers its readings from the air in the top of the radiator.

NONES MAKES CHARGES

Louisville, Ky., May 16—W. C. Nones, former president of the Kentucky Wagon Mfg. Co., issued a statement yesterday in which he made charges of mismanagement



Obituary

GEORGE A. MATTHEWS, president and general manager of the Jackson Automobile Co., Jackson, Mich., died on May 13, while he was in his office. Mr. Matthews had long been identified with the business of Jackson, having started the Jackson Automobile Co. in 1900, becoming secretary and treasurer. Previous to this he was connected with the Fuller Buggy Co. and the American Wheel Co. At the time of his death he was director of one of the Jackson banks and always had the city's civic welfare at heart. Mr. Matthews is survived by two sons, Howard and George A., Jr., who are actively connected with the Jackson Automobile Co. and who will continue the business without interruption.

and misrepresentation against R. V. Board, his successor, accused directors of intrigue and made an appeal to stockholders for proxies of stock to be voted at the annual meeting, May 27, indicating that he would make a fight to regain control. Mr. Nones proposed an almost entirely new board of directors. The Kentucky Wagon Mfg. Co. manufactures the Urban electric truck. It is a \$1,500,000 concern.

The statement was issued as a report of Mr. Nones for the last 7 months of his administration—from May 1 to November 30, 1913—and as a "recital of occurrences during 6 previous years." Mr. Nones stepped down as president of the company last December and was succeeded by Mr. Board, who formerly was connected with the International Harvester Co. in the east. John W. Barr, Jr., Philip S. Tuley and others are among those of whom criticism is made by Mr. Nones. President Board last night said he could make no comment on Mr. Nones' statement other than to say that any statements made by him to directors could be verified in every particular, despite the former president's charge that he had made misrepresentations.

PFEFFER TAKES FORD'S TITLE

Detroit, Mich., May 18—At a recent meeting of the board of directors of the Chalmers Motor Co. C. A. Pfeffer, treasurer, was made secretary as well, succeeding Harry Ford, who now is president and general manager of the Saxon Motor Co. Ford retains his position on the directorate of the Chalmers company, however.

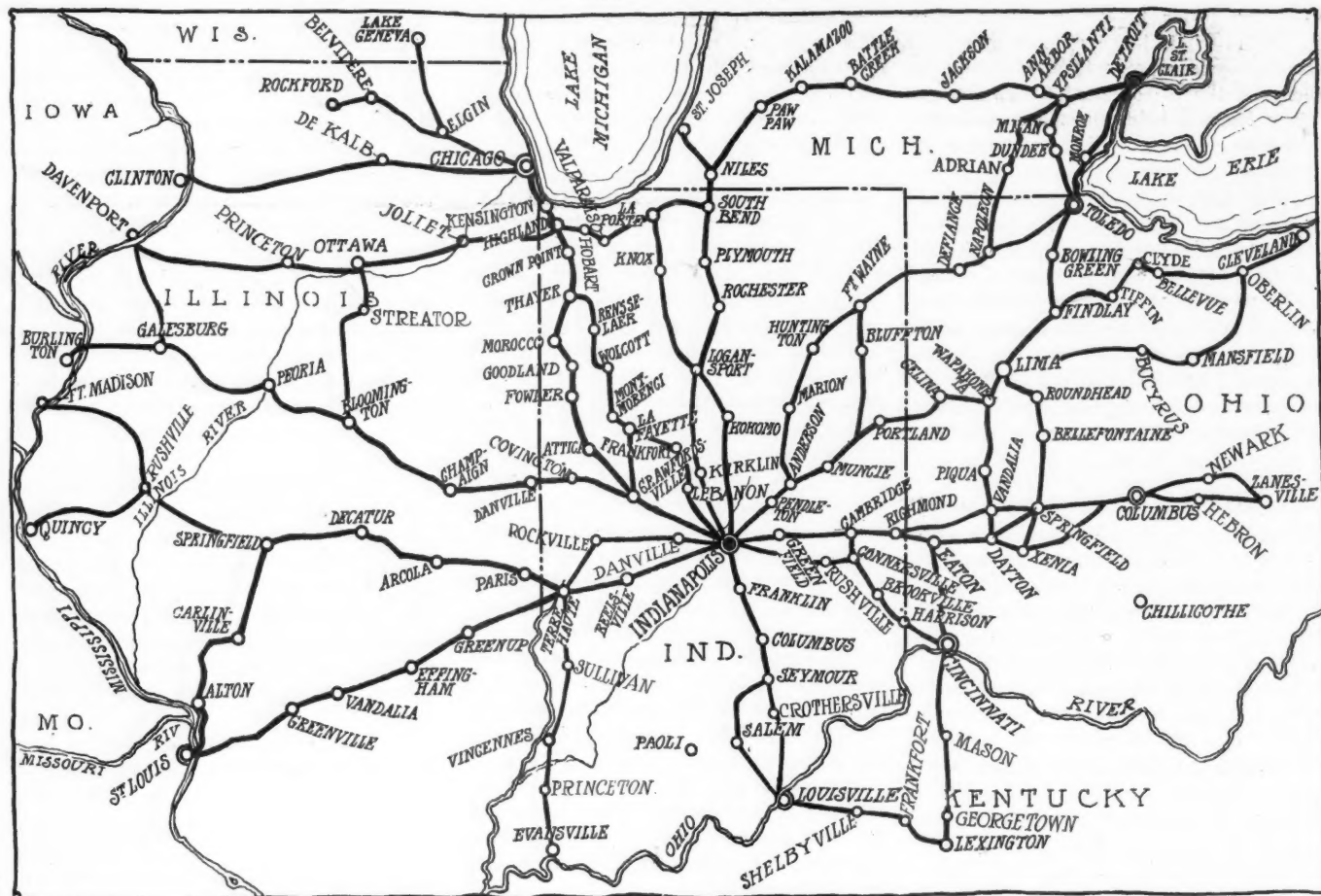
GARY COMPANY TO MAKE A SIX

Detroit, Mich., May 18—The Gary Automobile Mfg. Co. is the name of a concern which was incorporated at Gary, Ind., about a month ago to manufacture a six-cylinder speed car and six-cylinder touring car. The incorporation is for about a quarter of a million and several moneyed men of Gary and vicinity are said to be interested. Among these is Dr. G. Pass who is president of the concern. Other names connected with it are C. J. Flannigan and D. C. Throckmorton, E. T. Birdsall, chairman of the Detroit section of the Society of Automobile Engineers and representative in Detroit for Brandenburg & Co., is consulting engineer and purchasing agent.

The Gary company has established a factory and plans to make about 100 cars the first year. The first model will be built in Detroit under Mr. Birdsall's supervision and the balance at Gary. The motor to be used is a 3¾ by 5½ type, the same for both cars except the one for the speed car has a different camshaft than the other. Wire wheels, streamline body, 131-inch wheelbase, Timken axles, and Westinghouse starting and lighting are features. The price is to be \$2,300 for either car. Mr. Birdsall retains his present connections.

Routes and Touring Information

How to Drive to 500-Mile Race at Indianapolis



PRINCIPAL ROUTES TO INDIANAPOLIS COVERING RADIUS OF 300 MILES

FOLLOWING its usual custom Motor Age herewith presents for the benefit of those of its readers who are planning to tour to the 500-mile race at Indianapolis information that will be of value to them. It has selected middle west territory for this and offers route suggestions within a radius of 300 miles. Road conditions in this territory also are given wherever possible; hotel rates are quoted and other information that will be useful for the consideration of those who drive to the big race.

CHICAGO TO INDIANAPOLIS

For those who will make the trip through in 1 day the shortest and best known route is via Crown Point, Rensselaer and Lafayette. The total distance is 196 miles and with a very early start can be made without difficulty by the fast travelers as road conditions are good with hard roads practically all the way. Those who desire to take the trip more leisurely can leave Friday afternoon and plan on making Lafayette at 131 miles or Crawfordsville at 154 miles, staying at either place for the night, then continuing 66 miles into the Hoosier metropolis if a La-

fayette stop is made, or 41 miles if Crawfordsville is the plan. Rooms should be engaged in advance to insure accommodations. At Lafayette the Lahr's regular rates are \$1 to \$2.50 a day and the St. Nicholas 75 cents to \$1.50, while garage accommodations can be had at the Fred Reule garage. In Crawfordsville there are the Crawford and Ramsey hotels, and numerous garages abound.

Indianapolis Hotels

Severin, European, \$1.50 to \$4.
 Claypool, European plan, \$1.50 and up.
 English, American plan, \$2.50 and up
 —European, \$1 and up.
 Spencer, American plan, \$2.50 to \$3.00
 —European, \$1 to \$1.50.
 St. Denis, American plan, \$2 to \$2.50
 —European, \$0.75 to \$1.50.
 Washington, European plan, \$1.50 to \$3.
 Denison, European plan, \$1.50 to \$3.
 Grand, European plan, \$1 to \$2.50.
 Imperial, European plan, \$0.75 to \$2.
 Linden, European plan, \$0.75 to \$2.
 Onelda, European plan, \$0.75 to \$2.
 Loraine, European plan, \$0.75 to \$1.50.
 Sherman, European plan, \$0.75 to \$1.50.
 Princeton, European plan, \$0.50 to \$1.50.
 Kingston, European plan, \$0.75 and up.
 Plaza, American, \$1.50 and up.
 Edward, European, 75 cents to \$2.
 Colonial, European, \$1 and 2.

Chicago to Lafayette is via Kensington, Riverdale, Thornton, Munster, Highlands, Schererville, Crown Point, Thayer, Rensselaer, Remington, Wolcott and Montmorenci. Lafayette into Indianapolis direct is through Frankfort and Lebanon, reaching the speedway without going through the congested parts of town by turning onto Speedway avenue. Lafayette via Crawfordsville runs through Romney, Crawfordsville, Whitesville, New Ross, Jamestown, Pittsboro, Brownsburg and Clement direct to the speedway, on almost a straight road of 41 miles. The center of Indianapolis is 4 miles beyond.

A good option to the above is between Thayer and Crawfordsville without passing through Lafayette. It extends through Morocco, Brook, passing George Ade's home, Goodland, Fowler, Attica, Newton and New Richmond. About 3 miles before reaching Attica a slight detour may be made at Mudlavia for Kramer for those desiring to make a night stop at this point instead of one at Crawfordsville.

Another route which is becoming more popular all the time is to go east on the South Bend road via Hobart and Valparaiso to La Porte, 73 miles, then almost straight south, crossing the Kankakee river, going through Knox, around the southern edge of Bass lake, through Winamac, Star

City and Royal Center to Logansport for the night. This makes the mileage from Chicago 144 miles. The hotels here are the Barnett, at \$2.50 to \$4 a day, the New Dunn at \$2 and \$2.50, and the Murdock at \$2 to \$3.50. From here to Indianapolis there are two routes. The more direct is over the old Michigan road 70 miles through Burlington and Kirklin and is practically a straight road without any turns, but the road surface is not in quite as good shape as the longer route of 80 miles via Walton, Kokomo, Westfield and Carmel.

LAKE GENEVA TO INDIANAPOLIS

Motorists from Lake Geneva going to the races should drive to Chicago first, making a run of 82 miles through Hebron, Crystal Lake, Algonquin, Elgin, Addison and Oak Park.

CLINTON, IA., TO INDIANAPOLIS

In picking a route for Clinton motorists who are to tour to the races the road to Chicago should also be patronized. This is a day's run of 148 miles through Sterling, Dixon, Franklin Grove, Rochelle, DeKalb, Geneva, Lombard, and Maywood.

PEORIA, TO INDIANAPOLIS

This is a 223-mile trip by way of Bloomington and Champaign and meeting the Chicago-Indianapolis road at Crawfordsville. A start should be made Friday afternoon with the object of reaching Crawfordsville for the night stop, then going 41 miles to the speedway. The towns en route are Groveland, Tremont, Mackinaw, Danvers, Bloomington, Le Roy, Farmer City, Mahomet, Champaign, Urbana, Homer, Danville, Covington, Veederburg and Wayne-town.

SPRINGFIELD TO INDIANAPOLIS

Springfield to Terre Haute is a run of 143 miles and practically all dirt road with the exception of in the neighborhood of Decatur and Terre Haute, while the National road is gravel or stone. Through New Buffalo to Decatur, where about 7 miles southwest will be found the old Lincoln cabin still kept intact, and in Fairview park the original log cabin in which Lincoln practiced law, through La Place, Livingston, Arcola, Oakland, Paris and Elbridge will see the motorists in Terre Haute, the center of the Indiana coal district. The Terre Haute and Filbeck are the best hotels, while accommodations for the car will be found in the Terre Haute, Cole, Haddon Hall and Vigo garages.

Routing through Brazil, Reelsville, Coatsville, Stilesville, Belleville and Plainfield enter Indianapolis over Washington street. Quincy motorists will have 120 miles to travel to Springfield through Clayton, Ripley, Pleasant View, Beardstown, Bluff Springs, Ashland and Pleasant Plains before following the above to the races.

ST. LOUIS TO INDIANAPOLIS

If weather conditions are good, the National highway can be traversed to the races, while an alternative is the Alton way via Carlinville and Springfield. With an easy pace, about 9 hours can be figured on to reach Terre Haute. The distance is 173 miles and an early start Friday morning, figuring on making 107 miles, will route you through Collinsville, Mulberry, Vandalia, Brownstown, Dexter and Effingham for luncheon or probably only Vandalia can be reached by noontime. The balance of the day will be taken up in getting to Terre Haute, passing through Montrose, Vevay, Oakleaf, Martinsville, Clarks and Marshall. The Terre Haute-Indianapolis stretch has already been given.

For a routing over the Alton way, Springfield at a distance of 117 miles can be reached over dirt roads through Granite City, Mitchell, Oldenburg, Alton, Godfrey, Piasa, Me-

dora, Chesterfield, Carlinville, Girard, Auburn and Chatham.

LOUISVILLE TO INDIANAPOLIS

The direct road from Louisville is 124 miles and as far as Seymour, 61 miles, it is very poor, but it is doubtful if anyone would take the longer route by 10 miles to avoid this. However, both routes are given and the tourist can make the choice. The direct run is New Albany, Sellersburg, Henville, Scottsburg, Cruthersville, Seymour, Waynesville, Columbus, Taylorville, Amity, Franklin and Greenwood. The longer route is an option as far as Seymour and routes through Pekin, Salem, Vallonia and Brownstown.

LEXINGTON TO INDIANAPOLIS

Lexington motorists can go either first to Louisville or to Cincinnati, the distance being 79 miles as against 84 miles, with the road to Louisville in the best condition. The towns are Versailles, Frankfort, Graeffenberg, Shelbyville and St. Mathews. The Seelbach is considered the best hotel at Louisville. In making the run to Cincinnati the towns are Georgetown, Corinth, Mason, Williamstown, Dry Ridge, Sherman, Crittenden, Walton, Florence, Erlanger and Covington. Cincinnati hotels are the Sinton, Munro and Alms.

CINCINNATI TO INDIANAPOLIS

There are two very good roads for the Cincinnati speedway enthusiasts to choose from, both in very fine shape. The longer road is 138 miles, gravel or macadam all the way and through Avondale, Reading Road, Hamilton, Collinsville, Camden, Somerville, Eaton, Westville, Richmond, Centerville,

Germantown, Cambridge City, Dublin, Lewisville, Knightstown, Charlottesville, Greenfield and Cumberland. The shorter run of 116 miles follows along the White river valley and is a very picturesque ride but there is one bridge out. The itinerary is Cheviot, Miami, Harrison, New Trenton, Cedar Grove, Brookville, Everton, Connersville, Glenwood, Rushville, Arlington, Morristown, Fountain-town, Carrolltown, New Palestine and Hawthorn. Either of these roads can be made starting early the day of the race, or going as far as Cambridge City Friday and leaving 53 miles for the next morning if the longer road is taken. For the shorter run the 58 miles to Connersville can be made Friday, stopping at the McFarlan hotel, then going the remaining 58 miles to Indianapolis the next morning.

SOUTH BEND TO INDIANAPOLIS

The best road out of South Bend is 141 miles long. This can be made the morning of the race by those who wish to travel fast and for those who can leave the day before the run to Kokomo, 89 miles, can be made, stopping at the Hotel Francis. The routing is via Lakeville, Plymouth, Rochester, Perrysburg, Mexico, Bunker Hill, Kokomo, Westfield and Broad Ripple.

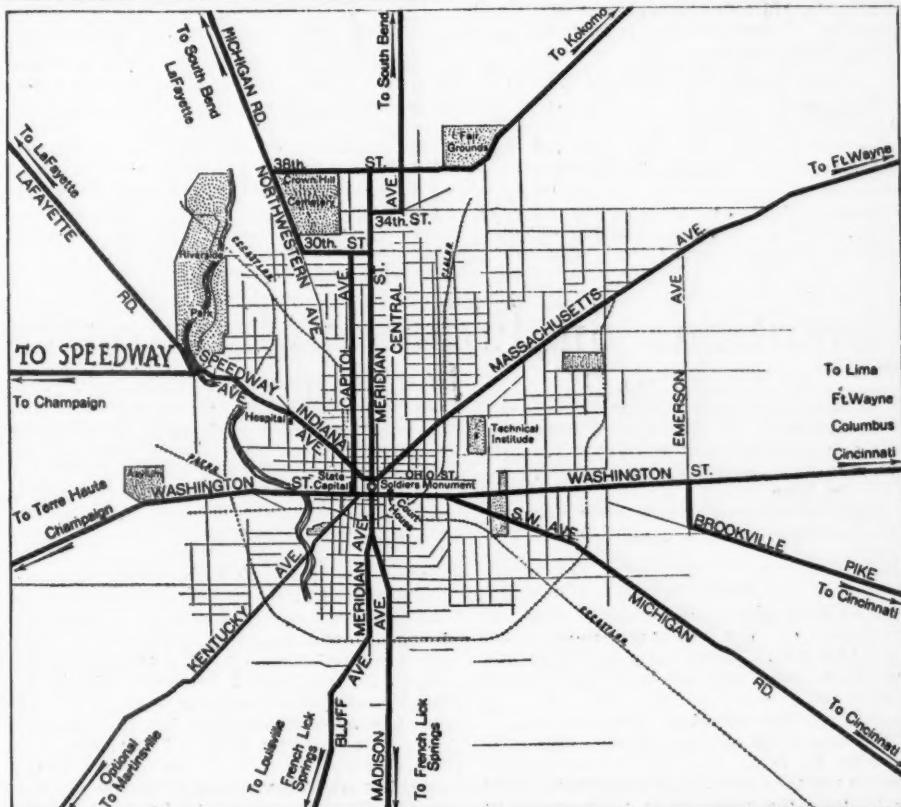
DETROIT TO INDIANAPOLIS

The road for the Detroiters is to Ft. Wayne the first day, being 172 miles, through Tecumseh, Adrain, Stewart, Lyons, Wauseon, Napoleon, Defiance, Brunersburg and Maysville. Hotels in this city are the Wayne and Hof Brau. This leaves 138 miles of travel over good gravel road for the next morning, running through Bluffton, Petroleum, Pen-ville, Redkey, Fairview, Muncie, Anderson, Pendleton and Cumberland.

TOLEDO TO INDIANAPOLIS

Toledo motorists can go to Ft. Wayne in a run of 109 miles over a gravel or macadam road, meeting the above routing at Napoleon by first traveling through Maumee, Moncloa, White House and Liberty Center. The road to Lima, 80 miles, can also be taken, going through Perrysburg, Bowling Green,

TO REACH THE SPEEDWAY
Starting from Soldier's monument go north one block on Meridian street, where turn left at postoffice on Ohio street; go one block and bear diagonally right onto Indiana avenue. Just after passing iron bridge bear left on Speedway avenue; cross two railroads, and turn sharp left, crossing concrete bridge. Curve slightly right off of bridge, going straight to speedway.



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MAP OF THE CITY OF INDIANAPOLIS, SHOWING ROUTES TO SPEEDWAY

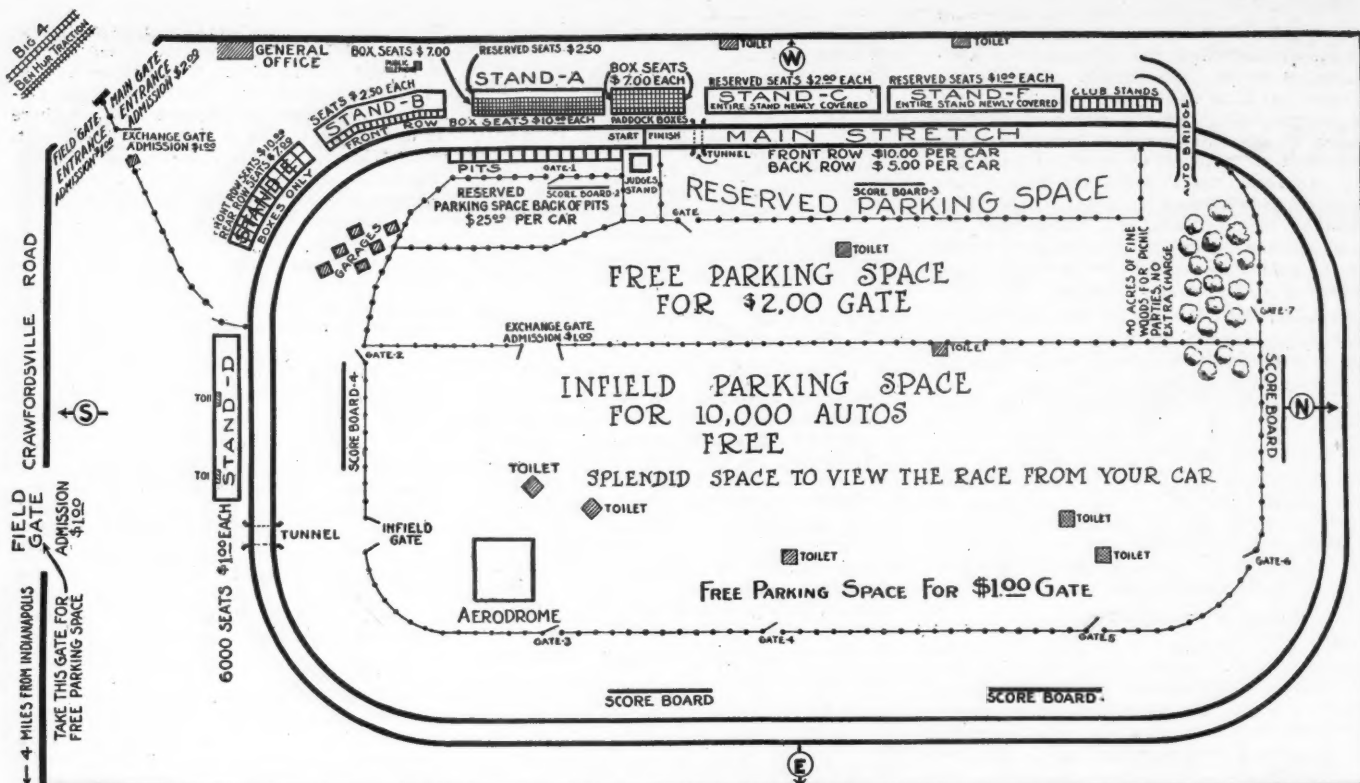


DIAGRAM OF THE SPEEDWAY AT INDIANAPOLIS

In order to gain admittance to the speedway a gate fee is demanded. The admission at the main gate is \$2 and at the field gate \$1. For seats and parking spaces reached through the main gate the following prices apply: Front row of paddock boxes, stands E, B and A are \$10 a seat, while the rear box seats of the paddock boxes, stands E and A are \$7 a seat. Reserved seats in stands A and B are \$2.50, in stand C \$2 and in stand F \$1. Reserved parking spaces at rear of pits are \$25 a car and on the main stretch the front row parking spaces are \$10, the rear row being \$5 a car, all reserved. Free parking spaces along the west end back of reserved parking spaces can be had for the \$2 gate fee. For \$1 field gate admission box seats in stand D can be had for \$2 and reserved seats in rear for \$1, while free parking spaces can be had in the eastern portion of the track.

Portage, Findlay, Bluffton and Beaver Dam, then 163 miles through Criddersville, Wapakoneta, St. Marys, Celina, Coldwater, Portland, Dunkirk, Muncie, Anderson Pendleton to Indianapolis. The run Friday should be to Muncie, 176 miles, stopping at the Hotel Delaware. From this point it only is a short run to Indianapolis.

CLEVELAND TO INDIANAPOLIS

For those who can make their start Thursday, it would be well to plan the run of 161 miles to Lima for that day, then 163 miles to Indianapolis for Friday. The itinerary to Lima is through Dover, Elyria, Oberlin, Wakeman, Norwalk, Monroeville, Bellevue, Clyde, Tiffin, Fostoria, Arcadia, Findlay, Bluffton, Beaver Dam and Lima. The Friday

run to Indianapolis is outlined above for those who start from Cleveland.

COLUMBUS TO INDIANAPOLIS

The best road from Columbus is not over the National road, but by way of Xenia and Eaton. This makes the distance to Indianapolis 183 miles, which can be made Saturday morning with an early start or more leisurely by going 114 miles to Richmond Friday, passing through Alton, West Jefferson, London, Cedarville, Xenia, Dayton, Kingsville, Lebanon, West Alexandria, Eaton and Westville, stopping at the Hotel Westcott or Arlington. This leaves 69 miles for the Saturday morning run through Centerville, Germantown, Cambridge City, Dublin, Dunreith, Knightstown, Greenfield and Cumberland.

route to Franklin, Columbus, Seymour, Brownstown, Valonia, Salem, Pekin, Borden, Bennettsville and New Albany.—Hoosier Motor Club.

Davenport, Ia.

All western tourists contemplating a tour to Indianapolis should take either the River-to-River road across Iowa or the White Pole route from southern Iowa cities. From Davenport follow through Moline, Watertown, Sterling and Lincoln highway to Chicago. The road from this city to Galesburg is good—dragged dirt road marked with white-banded poles from Milan, Ill., to Galesburg. From Galesburg to Peoria it is bad because of general lack of maintenance. The road to Chicago is the best and practically all local tourists use it for all eastern travel, whether through southern Indiana or farther east.—Davenport Auto Club.

Quincy, Ill.

The Quincy-Springfield road is in very much better condition than the Quincy-St. Louis road. Though a good portion of this road is a dragged dirt road it is kept in fairly good condition. The Quincy-St. Louis route is a good deal of it a hard road but there are stretches in it that are not good, though we believe they are being remedied.—Beatty Auto Co.

Champaign, Ill.

The road from Champaign to Danville is in good condition. Danville to Crawfordsville is very good, and Crawfordsville to Indianapolis should be in very good order. Champaign to Peoria should be in fair condition, and Kankakee to Champaign will be in a few days.

Terre Haute, Ind.

The road between St. Louis and Terre Haute in wet weather is in bad condition and when the weather is fair it is just ordinary. The National road is improved only about one-third of the distance and there is

Conditions on Indianapolis Routes

Rensselaer, Ind.

THE Blue Book road between Chicago and Rensselaer is all open and in good shape with only 1 mile of loose stone near Demotte. The road to Lafayette is ever better and follows the Blue Book. We are writing our township supervisors asking their co-operation in filling up any small holes.—N. C. Shafer.

Lafayette, Ind.

All of the roads out of Lafayette, with the exception of the Lafayette-Bloomington road, are good. These highways are gravel and stone and are always good.—R. B. Cheltz.

Indianapolis, Ind.

The conditions of the highway from Indianapolis to Terre Haute, via the National road is not very good. Our suggestion would be to take the route from Indianapolis to Rockville, thence to Terre Haute. This is a little bit longer, but it is in very fine condi-

tion. Indianapolis to Champaign, Ill., which would be via Crawfordsville, Covington and Danville, is in good condition. The road to Lafayette is very much better via Lebanon and Frankfort. There is one bridge out, but the by-pass is not over ½ mile. It is very clear and very good. The road to Ft. Wayne via Anderson, Muncie, Redkey and Bluffton is in excellent shape. We do not know for certain how the road to Lima is, but have understood that it was good. The Columbus road is fine. The road to Cincinnati via Richmond and Eaton is in excellent shape practically all the way. The one via Rushville, Connersville and Brookville also is in fine shape with the exception of one bridge out: Going via Rushville direct to Brookville is fine between here and Rushville, and just medium between Rushville and Brookville, but south from Brookville it is in good shape. The direct road to Louisville south of Seymour is very poor. Our suggestion in going to Louisville would be to take the

a considerable amount of clay to contend with.—Terre Haute Auto Co.

The roads between St. Louis and Terre Haute are rough most of the way. I mean not a smooth road surface, but with bumps and dugouts which make slow time. The road from Vandalia into St. Louis is very good and smooth, between Vandalia and Effingham being the worst. Between here and Indianapolis it is fine and smooth and very fast time can be made over it. The road to Paris is pretty rough, Paris to Decatur, and very fine on into Springfield. The Terre Haute-Vincennes road is good except about 2 miles of sand near Oaktown. It is a little narrow all the way but smooth and hard.—C. A. Lloyd.

South Bend, Ind.

The best road from South Bend to Indianapolis is via Kokomo, but the most direct and easiest for those driving to the Indianapolis race to find is by way of Logansport.—Twentieth Century Motor Car & Supply Co.

Adrian, Mich.

Between Detroit and Adrian the roads are good, mostly gravel and part of the way stone. Between Adrian and Ft. Wayne the roads are good with some clay, some gravel and some stone.—Union Garage.

Ft. Wayne, Ind.

The roads around this section are very good. From here to Lima it is good with the exception of a few miles which are mud. I do not believe any difficulty would be experienced in going over this. From here to South Bend, by way of Churubusco and Goshen there is a good road and the one from here to Indianapolis by way of Huntington, Marin and Anderson is nearly all pike. Going to Toledo it is nearly all stone.—A. L. Randall.

Lima, O.

The roads out of Lima are all above the average, being good pike out of Lima, and continuing good at a distance from Lima. To Bellefontaine there is one bad overhead at the Erie railroad, which they have just put in, same being very rough, but can be passed easily without detouring.—Armstrong's Garage.

The road from Lima to Muncie is reported to be in good condition. I have driven part of the road the past week and found it good. To Cleveland via Findlay, Fostoria, Fremont and Clyde is reported pretty good. Lima to Toledo via Findlay and Bowling Green is good except about 5 miles between Findlay and Bowling Green, where the macadam is rough, but it can be traveled all right. To Dayton via Wapakoneta, Sidney, Piqua and Troy is very good. We have been having a great deal of rain for the past 3 weeks, but the roads dry up very quickly.—O. L. DeWeese.

Muncie, Ind.

There is a good gravel road from Muncie to Anderson, excellent pike to Pendleton, and good gravel into Indianapolis. From Pendleton the road is marked every tenth pole. Lima to Muncie is over a good stone pike as far as Coldwater and good gravel into Muncie.—Pross-Brooker Motor Co.

Columbus, O.

The best route for Columbus motorists to take to the Indianapolis races is via West Jefferson, London, Xenia, Dayton, Eaton and Richmond. This is much better than by way of Springfield and Vandalia and gives good travel conditions all the way through.—Columbus Automobile Club.

Louisville, Ky.

In routing to Indianapolis without a doubt the Seymour route is preferable at this time of the year, and then, too, it is shorter than the Bedford route by 44 miles. The pike

road from Lexington through Frankfort and Shelbyville is good the entire distance and should make an enjoyable run.—Louisville Automobile Club.

Lexington, Ky.

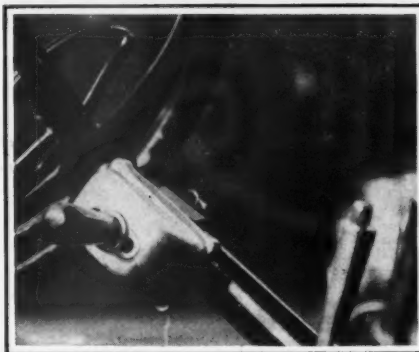
The road from Lexington to Louisville is extra fine, and two-thirds of the road to Cin-

cinnati is exceedingly good, the other third is a little rough.—C. O. Updike.

Vincennes, Ind.

Evansville to Vincennes is good except 2 miles of clay at the White river bottoms, but Vincennes to Terre Haute is good.—B. W. Beckes.

Hartford Electric Brake Demonstrated



HARTFORD BRAKE CONTROL

JERSEY CITY, N. J., May 15—A demonstration of the E. V. Hartford electric brake was held here today for the purpose of showing the efficiency of this system when actually installed on a car. The brake was first exhibited at the New York show in January and was described in Motor Age at that time. Up to this time, however, the device had not been used on a motor car.

The car used for the demonstration was a 120-horsepower six-cylinder Chadwick weighing more than 4,000 pounds. Traveling at the rate of 20 miles per hour the rear wheels were locked instantly by the brakes and the car slid to rest in less than 30 feet. Even quicker stops were made by not quite locking the brakes, but just interposing sufficient resistance to their turning to not cause them to lock.

Since exhibiting the device on the show circuit, Mr. Hartford has succeeded in simplifying the control to a considerable extent. Instead of having a large switch box mounted on the steering column and a cut-out box on the dash, there will be a simple two-point switch. This is supported on the steering column and places the control within easy reach of the driver's hand.

During the demonstration the car was driven through all kinds of traffic conditions and showed quickness of control without any manual labor beyond operating the switch. The electric brake replaces the emergency set and is used perpetually in service, the foot brake in reality becoming the emergency brake.

With the new type of switch a two-point control is given. The first point supplies enough braking power for service purposes and the second for an emergency stop. Pushing the switch back to its original position immediately disengages the brake.

A description of the method of applying the electric power to braking was published in Motor Age, January 1 issue. In outlining the system, however, it may be stated that the manual power applied in the hand emergency brake is displaced by high-speed series-wound electric motor. This motor has on the end of its armature shaft a worm which, through a reduction of 100 to 1, drives a gear. In turn this gear through an internal gear operates a drum through a reduction of 4 to 1. This gives a total reduction of 400 to 1. On the drum is wound a steel brake-pulling cable which directly transmits the pull of the motor to the braking mechanism.

When running idle the motor is capable of 10,000 r. p. m., and when under load it can apply 1,000 pounds pull at about the same speed as would be the case with a quick application of the hand emergency brake. After 1,000 pounds pull is exerted on the cable a slipping clutch prevents any further pull and a ratchet prevents the brake from slipping off. Because of the powerful pull on the brake cable it is perfectly feasible to have the brakes running in oil. This was the case on the demonstration car. The amperage draw in putting a 1,000-pound pull on the cable is 40 and the weight of the device is about 35 pounds. The net weight would be less than this because the emergency brake lever and much of the linkage would be removed.

The Hartford Suspension Co. is now prepared, after 4 years of experimental work, to manufacture the electric brakes in quantities. The brake can be applied to cars already in use by bolting the motor in place and replacing the links and rods with the drum and cable. The price of the outfit will be \$100.

BETHLEHEM THE A. A. A. MECCA

New York, May 16—Bethlehem in the White mountains has been selected as the rendezvous for the midsummer meeting of the American Automobile Association. All A. A. A. members are invited to tour to Bethlehem and it is anticipated there will be parties from all sections of the United States. Assurances of representation from Chicago, Indianapolis, Detroit, Cleveland, Buffalo, Pittsburgh, Philadelphia, Newark, N. J.; New York City, Providence, R. I., and Hartford, Conn., already have been given. A special general map is being drawn to show the most traveled routes to the New England country. All those who sign entry blanks for the tour will be provided with these maps.

Detroit Makers Running Up to the Production Limit

Saxon a Remarkable Example of Manufacturing Progress—Reports from Abbott, Krit, King Briggs, R. C. H., Monarch and Other Factories in City of the Straits

DETROIT, Mich., May 18—Not only are such concerns as Packard, Ford, Chalmers, Hudson, Lozier, Cadillac, Paige-Detroit and Hupmobile, whose business activities were discussed in last week's Motor Age, running at capacity and in some cases forced to operate overtime, but the entire manufacturing family here is in a most flourishing condition.

The inception and present rise of the Saxon Motor Car Co. stands out today as one of the spectacular aspects of the motor car industry in Detroit for the present season. This company under the direction of its president, H. W. Ford, the boy president, as he is known, has made unprecedented progress.

The idea of the company was conceived approximately 2 years ago. One year ago work actually was started on the design of the little car. The first Saxon model was out August 10, 1913. The present company was incorporated with a capital stock of \$350,000 on November 1. Possession was taken of the present factory a month later, December 1. The first chassis was scheduled to come through on February 15, but as this date fell on Sunday the completed chassis did not come out until Monday, February 16.

Following this was a production of thirteen cars in February. This jumped to 470 in March and the April output was 762. President Ford had hoped to put 1,500 out in April, but the inability to get rear axles and other parts made this impossible. The plans are to build 1,500 in May and the same number in June. Plans now are being completed to add a night shift which will give a daily output of seventy-five cars. On May 1 the factory started running at forty per day. Two hundred men are employed, more being added daily, and the factory is a three-story brick building with 50,000 square feet floor area.

Distributing the Saxon

The work of distributing a small car such as the Saxon, listing at \$395, is rather a task of organization and delivery than one of convincing the public of the ability of such a car. The demand shows a latent desire for such a vehicle and the company already has 300 direct dealers, nearly all of whom already have been handling other makes of cars, although its representatives in New York, Utica and Detroit, handle the Saxon exclusively.

Although many have predicted that the greatest demand for a small car would come from the rural sections, the Saxon company has found the biggest demands from cities like New York, Chicago, Detroit and others of like population.

Editor's Note—Herewith is presented the second and concluding chapter of the review of the Detroit motor industry as made by David Beecroft. Conditions in other manufacturing centers will be taken up in later issues of Motor Age.

Large industrial corporations in these places are purchasing these cars for their sales representatives.

Already big demands for American machines of this type are being received from foreign lands and the first export shipments of Saxons were made to South Africa and other lands on April 1. Dealers already have been arranged for in Argentina, Australia, the Philippines, Hawaii and other lands.

The phenomenal rise of the Saxon company is a good example of what can be accomplished in the motor industry when a movement is taken hold of in a business way. Here a majority of the time was spent in developing the car, so that after this was done production in quantities came as a simple question of organization. The Saxon is a good example for other concerns to follow.

Abbott Running to Schedule

E. F. Gerber, general manager of the Abbott company, which concern he took control of and reorganized last December, has at present 400 men on the payroll and expects to have 500 cars completed by the end of the present season. It has plans for an output of 2,000 cars for next year. The factory has been operating on a schedule basis since last December and now is working some departments overtime and on Sundays.

Since taking the factory over an entire system of reorganization has been put through. A new three-story building was completed recently and occupied last week. It measures 100 by 75 feet and is used for body work, painting, etc. This with other changes has increased the floor capacity of the plant 35 per cent. A top and body trimming department was started on February 15, this work being previously done by contract.

In analyzing the finances of the company Mr. Gerber says that by a complete rearrangement of the internal factory systems an economy of \$30,000 per month has been accomplished, chiefly by eliminating direct and indirect non-productive labor. Business throughout the country is good, with the west in the lead. Trade in six-cylinder models is particularly good in the east. Trades enter into most of the sales but the dealers are more conservative in these than formerly and place more rational values on used cars. The company's business practically is divided equally among its three models.

H. H. Crawford, general manager of

the Krit Motor Car Co., has a very encouraging story to tell about how the concern under the management of the creditors' committee has been able to so extend its business that all payments as stipulated in the agreement will be paid on time. The net profits for the month of April were \$50,000 and for March, \$40,000; so that there is no doubt of the concern being on the map in the future. In fact, on the new car which the concern brought out last year, business has been beyond expectations.

Since January 1, there have been more orders than the manufacturing department could fill, the increase from fifteen to twenty cars a day at that time to the present output of thirty a day being made necessary. A little better than 500 cars were shipped last month, and as regards money, more was made last month than during the whole of last year. And now, while the factory is not flooded with orders, Krits are not being stored or consigned nor are they being shipped to dealers who do not want them. At the present rate the factory expects to be through with the 1914 production in June. There are only 800 cars more to be built.

Dealers complain of a backward spring, Mr. Crawford says, but things are opening up in good shape. Eastern business is exceptionally good, and this may be due either to the fact that Krit formerly had poor representation in New York or to the impetus of the new car. Foreign business also is good, although not being specially pushed. Most exported Krits go to London, thirty-five to forty a month going there. South America, Germany, Norway, Sweden, Australia, India, South America, Japan and Hawaii take exported Krits also.

Krit Strong in Middle West

In the United States the real good territory is found to be northern Illinois, Wisconsin, Minnesota and eastern Iowa. The coast has not proven a very good field. Krit has its normal number of men at present—about 350. In general, Mr. Crawford says, the concern has not felt any slump.

"There is much latent business today, but as to whether it will materialize into actual business in the immediate future is problematical. What we will call good business in the future for a motor company will not be extraordinary expansion and necessary factory enlargement but a steady sale each year."

In these words Artemus Ward, Jr., president of the King company, estimated the business situation of today as seen by him. The King factory is at present operating on a schedule of five cars per

day and has been working on its regular schedule since last fall, with the exception of temporary slight depression in March, which was general throughout the country. The middle west affords today the best chances of business, although New England is in particularly good shape and there is plenty of money there, irrespective of the finances of the New Haven railroad and other interests in which New Englanders hold heavy investments.

Mr. Ward looks for the small car, the machine listing at \$1,000 or thereabouts, to continue in popular favor irrespective of whether it is made in large quantities such as tens of thousands or in quantities of a few thousand. The success of companies with productions under 4,000 will depend largely on good business management and conducting the affairs on a business basis. Where a concern is so organized and so conducts itself it will continue, irrespective of quantity production.

Need of Combination Bodies

Looking to the future as to the medium-priced car, Mr. Ward sees wide possibilities in a vehicle which at \$1,500 can be sold with some form of combination body suitable for summer or winter use. So large a percentage of cars are little used outside of the city areas that it is possible with a single-compartment type of vehicle with plenty of window space and relatively light weight to be used for all the touring necessary.

The present tendency of many companies to increase their list prices from year to year is not favored strongly by this concern, which rather believes in a fixed price and prefers a reduction from year to year rather than an increase, this conclusion being based on an analysis of merchandising conditions. Quite frequently the buying possibility of the public is determined by the fixed value of the car. That figure becomes their estimate of car value. When they decide the question of a new model they will meet that figure, they will more readily meet a slightly lower figure, but it is more or less difficult to carry them \$200 or more higher in the scale of price.

The Regal company practically has completed its output of 5,000 cars, which it started production on last August. The factory has been operating steadily all winter and practically steady right up to the present. By the end of May the factory will be clean of 1914 cars and it is expected that all of the dealers will be cleaned up by that date, as there is scarcely a dealer with more than five cars on hand today, the company having followed the policy of shipping cars only as needed to the different distributing points.

Fred W. Haines, president of the company and directing spirit of the organization, says his company annually exports 1,000 cars or more, approximately 20 per cent of the business, and, further,

that this export business is growing rapidly.

Mr. Haines says that the foundations of the new Regal factory in Berlin, Ont., a growing city not far from Toronto, the capital of the province, have been laid and that the walls are up for the plant, which is a one-story building with capacity of 1,000 cars annually. Building operations on cars will start June 1. For the present the plant will be used for assembly work only, but ultimately, manufacture of all parts will be carried on there.

According to Claude S. Briggs, president and general manager of the Briggs-Detroit Co., this concern will close its season on August 1, with an output of 3,000 cars. The factory has been working overtime in the majority of its departments since the beginning of February and will have to continue at this over capacity for some time yet.

The Briggs-Detroit Co. enjoys a good export business, approximately 20 per cent of its total output going to foreign lands. Approximately 1 year ago there was more or less slowing up in the export business, due to a variety of causes. In Europe, the Balkan war had its effect; in South America several of the countries were in throes of financial depression; and the money stringency, through which several countries have passed in the last 18 months, obtained almost around-the-world significance. Approximately 6 months ago the export business began increasing and now it is particularly good in Australia, South Africa, England, Norway, Sweden, Russia and other countries.

In analyzing the buying conditions in America, Mr. Briggs, in accordance with many other manufacturers of cars listing around \$1,000, considers the states in the great Mississippi valley, as well as those bordering on the great lakes to be the leading market of such vehicles. With crop conditions favorable during the coming season there should be a large demand in this territory for 1915.

Progress of Monarch Company

The Monarch Motor Car Co., under the direction of the president, R. C. Hupp, began business last November and has today manufactured approximately 150 cars and now is getting on a basis of production of one car per day. Mr. Hupp, who has had wide experience in that this is his third small car within the last few years, takes the ground that "All motor cars sell themselves, so that when a car is right mechanically the ordinary man can demonstrate and sell it. In other words, there is no competition for a good car at any price. The public is a shrewd buyer and the demand for good cars at different prices is greater today than ever before."

The reorganized R. C. H. company, which purchased the stock of parts and a portion of the factory of the old R. C.

H. company on February 1, now has 100 men at work and is turning out approximately sixty cars a week. A. P. Sieder, president of the new organization, was secretary of the creditors' committee of the old R. C. H. company and while making up the stock which he took over, has introduced many changes in the car such as new streamline body, new top and other equipment, in addition to such chassis changes.

The present management is giving its cars a very complete test before shipment. The motors are given a block test varying from 6 to 48 hours and if not right are torn down and after assembly are given another test. Rear axles are tested for noise before being mounted in the car and each car is given a good road test. This program is being carried out with the 500 cars that are being put through in the first quota. The company has retained much of its old selling organization, approximately 75 per cent of the original 1,200 agencies having been continued.

Car-Nation Cramped for Room

The American Voiturette Co., which manufactures the Keeton large car as well as the Car-Nation light car, is employing 150 men at present, and had not factory room to take care of the manufacture of the Car-Nation light car on which deliveries were started in February. A large tent has been used for part of the work, and last week a second tent covering space 62 by 105 feet was erected for manufacturing purposes.

The Car-Nation light car—\$540 as a roadster, and \$565 as a touring car—is meeting with great success and the company is getting these through at a good rate compared with the short time it has had on them. A particularly good progressive assembly system is worked out in which a wheeled metal truck carries each chassis from the start of the assembly until the assembly is completed and the chassis delivered to the body department. Fifteen chassis are at the assembly floor at one time and they keep moving along from the start of the assembly floor to the finish of it according as the chassis grows by the addition of motor, radiator, and the other parts. Stock in great quantities is piled in all the storage space as well as in the surrounding yards. The company is manufacturing its large six-cylinder car in other space in the factory.

The Car-Nation is given a good work-out test before leaving the factory, the motor being first tested on a block. Every car is given a road test, varying in distance according to the requirements, and there is the usual final inspection.

H. H. Newsome, vice-president and general manager, conceived the idea of a light car, such as the Car-Nation 2 years ago, when foreign constructions were investigated. He early realized that the American light car would have to differ

from the English light car or cyclecar. Mr. Newsome was particularly convinced of the great possibility in America for such a light car, after investigating the inquiries from many owners of American motorcycles and many motorcycle manufacturers. In one instance, he found 3,000 reports of where motorcycle makers were unable to sell machines, and in practically every case the reasons advanced were the inability of the buyers to operate these machines so far as starting, etc., were concerned. On this assumption Mr. Newsome saw great possibilities in a light car which would be easier to operate and have greater comfort than a motorcycle.

At present the Car-Nation is largely distributed in such centers as Boston, Providence, New York, Philadelphia, Baltimore, Washington, Pittsburgh, Cleveland, Toledo, Nashville, Chicago, Minneapolis, Sioux City, Des Moines, Omaha, Lincoln, Kansas City, Wichita, Dallas, etc.

Scripps-Booth Busy

A side light on actual progress that is being made in the cyclecar business is found in the Scripps-Booth Cyclecar Co., which occupies a four-floor plant 150x70 feet, given over entirely to the manufacture of the Scripps-Booth cyclecar. This company delivered 100 cyclecars in April and is manufacturing at the rate of twenty per day at present. The company has a force of seventy-four men working on the assembly of parts and twenty-four men in addition manufacturing its bodies, which are a combination with the frame work on which the motor and transmission parts are carried.

That this company really means business is convincingly proven by a trip through the factory. Twenty-four cyclecars were going through the rough assembly department, eight others were in the final assembly and stock of parts for upwards of a thousand cyclecars were found in various sections. In one pile were a hundred complete rear axle assemblies; nearby was a pile of 200 completed front axle assemblies; in one corner were 130 complete motors; the body department showed by actual count 300 in various stages of completion; there were thirty other bodies in the upholstering department; and others were in the top department.

The visitor to the Scripps-Booth plant is impressed on every hand with the one fact that so far as this company is concerned the cyclecar is a reality and not something to be produced. Scripps-Booth are actually producing and delivering through their twenty-eight distributing points which have been built up.

J. J. Batterman, general manager of the company, has been a cyclecar exponent for 2 years, when the company first took up the movement, by having J. S. Booth, designer of the company, study the movement in company with Mr. Bat-

terman, in England and other European countries. After this investigation the company brought out its first cyclecar last July. Mr. Batterman is an exponent of the pure cyclecar type of vehicle and selected a 36-inch tread because he believed that with such a design it would be possible to reduce the twisting strains and thereby make possible a lightweight vehicle.

In August last the company sent its cyclecar on a trip to three states covering a distance of 1,000 miles, and it was after the demonstration so made that the company was convinced of the possibilities of such a vehicle. Mr. Batterman's aim for 1915 is to produce a cyclecar that anyone would be glad to use and a vehicle that because of its light weight will have the flexibility of a six-cylinder large car. He looks for a large export business and present indications are for a big demand by representatives of large populations. The company is manufacturing to close limits and using jigs in all its body parts.

F. E. Price, second vice-president of the Anderson Electric Car Co., points to the more general use of the electric passenger car in small cities as the most characteristic factor of this business during the present year. Instead of selling electrics in twenty or twenty-five of the larger cities, the Detroit electric is now handled through 125 dealers in as many different cities.

The electric car has been taken up in a much wider sense than it was considered 2 years ago and there are today many business men who are using it as a utility vehicle to go to and from work, the same being true of many smaller makes of gasoline cars, this movement, both with the electric and the small gas car, indicating a new movement which has taken hold in our larger cities within the past 2 years.

Power Companies Assisting

The local electric power companies have greatly assisted in promulgating the doctrine of the electric by the active work they are doing in giving better rates on current for battery charging, giving better service to garages and lastly by their advertising campaign. With these companies it is a case of the more vehicles the more current used.

Mr. Price, in commenting on the general scope of the electric vehicle, states that the coast is a particularly good field and differs from other sections of the country in that the open body is considerably in demand. Los Angeles, San Francisco and Portland are particularly good coast centers. The great middle west continues to be a good field for electrics and even in New England marked progress has been made in cities such as Hartford, Conn.

Business is reported good in Brooklyn and Washington. Baltimore, although slow, is improving and conditions are better in Philadelphia. New York never has

been a good electric city for passenger vehicles but is making fair headway. The lake cities, viz. Chicago, Detroit, Cleveland and Buffalo, always have been headquarters for the use of electric vehicles.

One favorable aspect of the electric business is the general improvement in the condition of the dealer. Each year a better class of people has taken hold of the electric, seeing rapidly increasing possibilities for it. Introducing a better class of business men into this field is bound to produce results.

Mr. Price reports that the double-control vehicle, in which the controller and other handles can be operated from either the front or rear seat, is proving popular in five or six of our large cities, where traffic congestion is a factor to be reckoned with, but in the smaller cities the single-control vehicle retains its popularity.

Grinnell Doing Well

The Grinnell Electric Car Co. is enjoying a good trade, although business was quiet the first of the year, quite naturally. E. W. Grinnell, secretary and general manager, states that at present the concern is working its factory harder than it has since last summer. This is the busiest season and it is expected that things will be pushed until July 1. The increase of business started about the middle of March and has continued so ever since.

Mr. Grinnell says further that the Grinnell company is in the best shape it ever has been financially, being practically out of debt. The Grinnell business is carried on very conservatively, and its sales are practically all cash, there being no sales on consignment whatever. The concern does not aim at a large production, and goes along carefully until it finds out exactly where it stands as regards sales before allowing anything to effect the factory's output.

Business with the Federal Motor Truck Co. was 15 per cent larger during the first quarter of 1914 than during the corresponding month of a year ago. The company is at present working to capacity with a force of 115 men, manufacturing approximately 100 trucks per month, and is aiming at an output of 125 for May. This company started shipping trucks in August, 1911, scarcely 3 years ago, and to date has delivered 2,500 vehicles.

M. L. Pulcher, general manager of the company, says that the present business is equally divided between repeat orders and trucks sold to new companies. He considers general conditions throughout the country better than they have been for some time, and reports that the factory has been running steadily since last August when the 1914 season was opened, and expects to keep right along at capacity until the output for the season is completed. Mr. Pulcher in analyzing general truck conditions considers the most favorable trend on the part of the

makers is the general endeavor to manufacture a better truck and sell it at a list price, the latter fact being a major consideration which many companies have been too slow to realize.

Viewing the situation from the buyer's standpoint, Mr. Pulcher believes that the purchaser has progressed during the last 2 years so far as his knowledge of motor trucks is concerned, and is more rational in the selection of vehicles. The Federal company has made a policy of frequent conferences with its dealers when the entire scope of the business was discussed and methods of selling practices and maintaining them analyzed.

Federal Dealers Carry Parts

A special factor in connection with the Federal business is the effort the company makes to see that an adequate supply of spare parts is carried by each dealer. This stock varies according to the distance from the factory and the number of vehicles in the territory. Thus a dealer 2,000 miles from the factory would carry a larger supply of spares than one 200 miles away. In order to make the carrying of spare parts possible, the company consigns 50 per cent of these spare parts, collecting from them when sold, the dealer carrying at his own expense the other 50 per cent. Stock reports are furnished by the different dealers each month.

Mr. Pulcher considers that trucks are operating to better advantage today than ever before, due to the fact that there is less trouble caused by overloading and overspeeding. Consistent inspection by the dealers of the trucks in use generally aids in this work. Many of the dealers, in addition to the service truck, have two good mechanics, road inspector on a motorcycle, together with a good supply of parts.

The extension of the zone of truck business during the last year is one of the best indications of certain progress trucks are making. Some of the industries which are taking leading places as owners of Federal trucks are: Bakers, bottlers, brewers, bus lines, confectioners, creameries, dairies, decorators, fruit growers, florists, furniture, hardware, laundries, plumbers, cartage companies, stovemakers, as well as numerous other industrial concerns such as shoe manufacturers, ice cream companies, grain dealers, wholesale druggists, etc.

"The problem of getting men who will work in selling trucks is the biggest job in truckdom today and much in excess of any difficulty in manufacture." These words from General Manager Pulcher, not only sum up the Federal situation but echo the sentiments heard in many truck factories. Merchandising is a big problem. The whole Federal selling force is made up of men taken from outside of the motor industry and men who have had wide experience in merchandising other lines. These men have learned real sales

manship, and are not burdened with any of the conceptions of passenger car salesmanship which so often proves more of a detriment than a help to truck salesmen.

W. G. Wagenhals of the Wagenhals company, builder of 800-pound three-wheel delivery cars, reports that his company with its force of thirty-five men is manufacturing on a basis of three cars a day and that conditions are greatly improved over a year ago so far as the amount of business is concerned. At present the government has forty of these vehicles in its parcel post work and at present many package delivery companies are taking it up. In Detroit the Metropolitan Package Delivery Co., organized 7 months ago, is using six cars; a similar organization in Dayton, Ohio, is operating a fleet of nine of these vehicles; and in Salt Lake City and Los Angeles are other package delivery organizations using the Wagenhals' three-wheeler. At present the company has a traveling representative who is stimulating the organization of companies for this field of work, with good success.

As a merchandising product Mr. Wagenhals considers the three-wheeler practically the only example of motor vehicle which can be used to substitute the one-horse wagon, this vehicle listing at \$690, being very little in excess of the outlay for a single-horse wagon with horse, harness, etc., and offering double the radius of delivery.

Some time ago the company brought out its three-wheel electric, which has a radius of operation of 55 miles per charge of battery and which vehicle is now being tested by the United States government in the Detroit postoffice.

Standard in New Plant

The Standard Motor Truck Co. only recently moved into its new factory, which is a two-story brick building 75 by 50 feet and with a capacity of three trucks every 2 days. In addition to occupying its new plant the company has completed the purchase of adjoining property of 304 feet street frontage and 160 feet depth. At present there are cottages on this property, but these will be razed and a factory addition built. Building will start on the new building in 6 months. W. C. Hood, sales manager, reports that, beginning with February 15, business has been improving very generally and that conditions are much better than a year ago. The Standard company finds business in the northern part of the Pacific territory good, but conditions in the southern part slower. Detroit, Portland and Seattle are the strongest selling centers of the company. Business conditions are reported good in Chicago, Minneapolis, Milwaukee and Duluth.

In its 2 years' career the company has built 184 trucks, according to Mr. Hood. The repeat business is a 10 per cent factor with this company and is growing steadily. This company has specialized on a 3-ton

truck and only 2 months ago added a 5-ton vehicle to its line. According to Mr. Hood, buyers today are more critical than they were some years ago, being better educated as to the type of truck that is best suited to their particular needs. A feature of the new Standard assembly room, which has capacity for assembling seven trucks at once, is a mono-rail overhead trolley system supported on the ceiling of the assembly room. This track system has switches so that a motor with its gear-set unit can be carried to a point directly over where it has to be dropped into place in the chassis. Thus is labor saved and work facilitated.

Situation at Universal Plant

C. P. Derr, assistant to President George Uihlein of the Universal Motor Truck Co., reports that his factory has been working on schedule without a shutdown during the present season and that for over 3 months the machine shop departments have been working overtime. This is the fourth year of this company in its four-story brick factory, which was built specially for truck manufacture. At present 150 men are working on the four models of the company—1.5, 2, 3 and 5-ton types. The 1.5-ton model, with its worm-driven rear axle, constitutes 90 per cent of the company's business.

In summing up generally on the present truck situation, Mr. Derr considers the coast the best market, Portland, San Francisco and Los Angeles being very active truck centers. Business in New York, Boston and New Haven also is good. Truck sales largely depend on territorial conditions; for example, the Pacific coast is better today than the Atlantic. The western business man is a better money-spender than the easterner, and with a closer touch on the great agricultural possibilities, is more ready to invest in trucks than the New England man. Twenty-five per cent of present business is repeat orders. Worm drive is a strong selling argument.

Mr. Derr thinks that one of the pronounced trends in motor truck development for the year is the trend towards the use of smaller units and smaller capacity vehicles. Cartage companies, wholesale grocers and journeymen plumbers who fit their truck body up as a repair shop are big buyers. The Universal company sells the majority of its 1.5-ton vehicles fitted with a standard body, which the company manufactures.

The Continental Motor Mfg. Co., which has large plants at both Detroit and Muskegon, Mich., has had all it could reasonably do since January 1, says R. W. Judson, vice-president and general manager. The Detroit plant, which now is devoted exclusively to the making of six-cylinder motors is operating with a production of from seventy-five to eighty motors a day. This is coming up right along with the increasing demand for sixes.

The Continental plant here is capable of still greater production and with the trend toward sixes which looks even more promising now as the summer approaches the factory no doubt will have its hands full. The concern is even now building an addition to its machine shop and putting in considerably more equipment, which will smooth out all departments to the same relative capacity.

While the Detroit plant is operating normally, the Muskegon plant, where the production rate for the last 3 weeks has been from 2,400 to 2,500 motors a month, is operating with day and night shifts. This plant makes small fours, which is a comparatively new type for Continental, and also all the commercial vehicle motors. In fact, the Muskegon plant shipped the most commercial motors in its history last month, and May has prospects of exceeding April. The working force now is 1,000 men and is normal.

Activity at Zenith Plant

At the plant of the Zenith Carburetor Co. production at this time had to be increased about 60 per cent over the corresponding period of last year. This increase was due to the increased output of the car manufacturers who are steady users of the Zenith, and the securing of many new orders. The improved conditions reported by the Chevrolet, Hudson and Hupp companies, V. R. Heftler, president of the Zenith company says, has had its effect upon his firm's output.

The Zenith company moved into its new quarters last summer and the new factory is so laid out that supervision is made easier. The travel of materials through the shop is now effected without retracing any steps; some new and improved machinery has been added and all with the result that the schedule of increased production can now be carried out without any increase in the working force.

April was the largest month in the history of the Timken Roller Bearing Co., Akron, O., and every month this year has seen business in excess of the corresponding month of a year ago. This concern began business 16 years ago and the most recent addition to the factory completed January of this year has added 15 per cent to the manufacturing capacity. This factory is devoted exclusively to the manufacture of roller bearings for domestic use, the foreign business being cared for by the English plant in Coventry. Since the season opened last fall there has not been a single letup in manufacture or shipments.

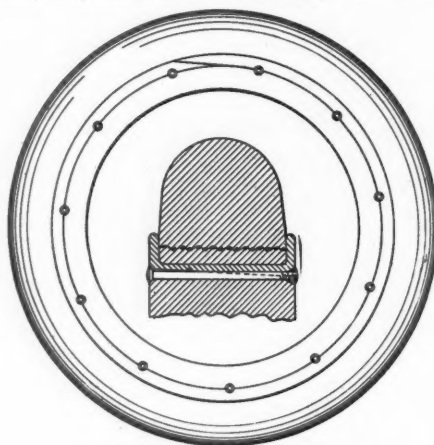
The Detroit end of this organization, known as the Timken-Detroit Axle Co., which specializes on front and rear axles for passenger cars and trucks, is ahead of a year ago in point of business done. E. A. Walton, advertising manager for both this and the Canton organization, says that the axle business with the growing motor car concerns still is on the increase, and that today more cars of the

growing concerns are using stock-made axles than ever before. These concerns realize that with an increase in their annual output it is easier to purchase outside axles than to add to their own factory facilities and force to make the additional axles for the increased production.

H. W. Alden, chief engineer of the company, reports that when a slackness sets in towards the end of 1913 and extended itself into 1914 that his company took up

Rim Patent Is Granted Standard Welding Co.

CLEVELAND, O., May 15—The Standard Welding Co. recently has acquired the patent rights to the John Baker rim. These are embodied in patent No. 707,538 issued to John Baker, formerly of Meacham, Ill., but now of Pasadena, Cal. The



BAKER'S DEMOUNTABLE RIM

One of the illustrations accompanying John Baker's original application for patents in 1902

patent covers improved rim and felly for rubber vehicle tires. It is dated August 26, 1902. Application was filed April 9 of the same year.

Efforts of the Standard Welding Co. to secure basic patents on what is known as the single-piece transversely-split type of demountable rim are said to have been successful with the acquisition of the Baker patent. The inventor and patentee is said to be the pioneer in devising a practical rim of the transversely-split type. The specification of the patent states that the object of the invention is to provide a rim which can be contracted to be inserted in an endless tire, and then expanded to engage and receive the tire, and be held in such expanded position by a felly. Means also are provided for preventing relative lateral movement of the split ends of the rim when brought together.

According to the Standard Welding Co., both the foregoing features are broadly protected by the claims of the patent, and are embodied in practically every demountable rim of the transversely-split type at present on the market. That a legal action based on this patent may follow is expected.

the question of greater efficiency in production, and used the interim to accomplish certain alterations in factory arrangements so that today under the improved regime the company is turning out more parts with fewer men than it accomplished a year ago.

Fair business is reported by the Bower Roller Bearing Co., which now is operating on a schedule of from 1,000 to 1,200 bearings per day and has its factory running normally with from 175 to 200 men. C. H. Heller, secretary and treasurer, states that Bower bearings are finding a good market both in Detroit and elsewhere.

April just passed was the best month the Bower company has had since last July, Mr. Heller says, and business is looking brighter every day. Like many others, his company had a slump last July and this continued for several months, gradually getting back to its normal again now and still improving.

E. & J. Lamp Production

Five hundred people are at present manufacturing 4,000 lamps per day at the Edmunds & Jones Mfg. Co., and this output can readily be increased to 5,000 per day in the present factory, the main plant of which is a three-story building, 215 by 115 feet. In addition to this is a smaller plant. This company shipped in March 70,464 lamps, in April 63,128 lamps, and will approximate 750,000 lamps for the year.

George E. Edmunds of the company says that they are at present running 10 per cent ahead of last year, and that the factory has not been shut down or schedule reduced, in spite of the fact that he considers the buying throughout the country approximately 30 days behind a year ago due to the backward weather conditions. The company is at present turning out practically 3,500 lamps per day for the Ford company, this representing equipment for 700 cars. In addition to selling to several of the large car makers, and a dozen or more of the smaller companies, the Edmunds & Jones Mfg. Co. supplies 175,000 lamps per year to the regular jobbing trade. The company also has a Canadian plant located at Walkerville, across the Detroit river, which will turn out 100,000 lamps this year. This factory was started a year ago and at present employs 100 men.

The Detroit Electric Appliance Co. is working with a force of 160 men producing approximately 150 of the starting and lighting units per day, and expects to increase this production to 250 in the near future. Two-thirds of the work of this plant is given over to the manufacture of a combined starting and lighting system complete for Ford cars. This system can be attached in 3 hours.

This patent must not be confounded with the ten patents granted to E. K. Baker and J. A. Anglada and recently acquired by the Universal Rim Co., as mentioned in Motor Age, May 14.

The Motor Car Repair Shop

X. D. JOHNSON, a Toledo, O., reader of Motor Age, during his experiences as a motor car repairman, has found that locating a loose part motor knock is rather a difficult matter without some instrument which will give one a clue as to which cylinder is causing the sound to be heard. The stethoscope is in use in a number of different shops and gives good results, but Mr. Johnson has made a very simple device out of an ordinary grease gun, which gives equally satisfactory results, he claims, and does not require any more than the opening of a priming cup and a few gun strokes, for operation.

A grease gun with a tight leather plunger is obtained, this gun to be about 2 inches in diameter and 12 inches long. The spout is so cut as to leave about 2 inches in place, as shown in Fig. 1. A piece of rubber tubing which will fit over the spout is then put in place so that it will extend about $\frac{1}{4}$ inch beyond the end of the spout. Two or three $\frac{1}{4}$ -inch holes are drilled into the cap of the gun so as to let the air out freely on the upward stroke of the gun. The cap is that portion on top of the barrel in which the plunger rod operates.

In operation, the priming cup of the supposed faulty cylinder is opened and the motor turned over until the piston is on top dead center with both valves closed. The rubber tube at the end of the gun is placed into the priming cup so as to form an air-tight joint and the gun is then operated with short, quick strokes. It is stated that should there be any loose parts they will be heard plainly when the pump has been given a few strokes. This has been tried by the reader and found to give excellent result and it is suggested that before the tests are made the motor should be operated for a short while so as to remove any gelatinous deposit which may have accumulated around the piston. This device is now in use at the shop of

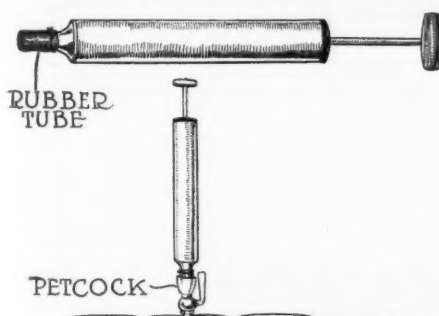


FIG. 1—FINDING A MOTOR KNOCK

A reader of Motor Age, in order to determine a loose-part motor knock, has made the instrument shown above, which consists of a grease gun with a small rubber tube fastened at the end. The tube is placed into a petcock and the gun then operated

Locating a Motor Knock

the Auto Repair & Machine Co., Toledo, O., and is giving excellent results in locating loose-part motor knocks.

A Battery Hint

A car was driven into a repair shop recently for an inspection of the battery system. The owner declared the car would not fire on battery side but would run well on the magneto. The repairman started the motor on battery side and failed to get an explosion, but when he switched to magneto the motor picked up perfectly. Starting at the proper place, the source of battery ignition, the repairman found that the battery terminals were corroded so badly that little or no current would flow to the cable. He

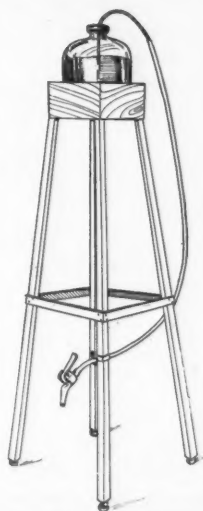


FIG. 2—A HANDY STAND FOR BATTERY MEN

Garagemen whose work consists in bringing battery cells to level with acid, electrolyte, or distilled water can do better and faster work with the stand shown above. A small chemist's clip is used to control the flow of liquid

immediately removed the cable and instead of taking a knife and scraping the corroded portion from the post, he took a piece of ordinary cord and started to run it back and forth around the threads of the post, as shown in Fig. 3. He soon had the threads nicely cleaned and polished, the terminal made good contact and the motor started easily on the battery.

A Stand for the Garage

In many garages the replenishing of storage batteries with electrolyte, distilled water or acid is done in a wasteful manner, the liquid being carried around in a bottle or container of some sort and when a battery requires attention the liquid is poured into it. The chances of spilling are great and the time consumed in do-

ing the work is much more than in the method described below.

A stand, shown in Fig. 2, is used to carry a carboy containing either acid, water or electrolyte. This stand is about 5 feet high and is fitted with casters so that it may be rolled from place to place easily. The carboy is placed on top of the stand, as shown, and from it is led a tube. The small part of the tube extending into the carboy and out about 3 inches, is made of glass, while the remainder is rubber. A glass vent tube is also inserted into the carboy stopper. At the bottom of the rubber tube is an ordinary chemist's clip which may be bought at almost any drug shop or drug supply house. The clip forms the means of controlling the flow of liquid to the battery; prevents waste and makes filling easy, especially in a dark portion of the garage or repairshop. There is no reason why a stand cannot be made to accommodate three small carboys, one with water, one with acid and another with electrolyte and each rubber tube painted a different color. The battery man can then go from car to car and fill the batteries with whatever liquid is necessary.

Hammering Metal Parts

Before a metal part is struck with a hammer one should consider the situation and use the proper hammer or method, so that the part will not be injured. Parts with polished surfaces should be struck with either a fiber hammer, a wooden hammer, or they should be covered with a few layers of cloth and the ordinary metal hammer used. In this way the polished surface is not injured. One should also consider the kind of metal, whether hard or soft, so that the metal shall not be broken. Hardened steel has a tendency to crack when struck. Such things as this should be considered beforehand.

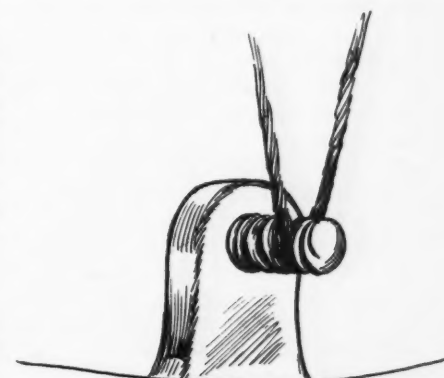
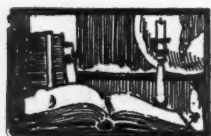


FIG. 3—CLEANING BATTERY POSTS

A storage battery with corroded posts may be made to make perfect contact with the cables by simply running a piece of cord around the threads as shown above. This makes the threads clean and bright



The Readers' Clearing House



GEARING, TIRE SIZE AND SPEED

How to Find the Miles Per Hour with
R. P. M. and Gear Ratio Given

KANSAS CITY, Mo.—Editor Motor Age—What is the proper valve timing of a T-head motor to obtain the greatest speed?

2—What speed would a car make at 2,000 r. p. m. with 2½ to 1 gear ratio and 32-inch wheels and 2 to 1 gear ratio and 30-inch wheels?

3—Kindly give a simple way of figuring that.

4—How is the piston displacement figured?
5—What is the displacement of a Chalmers 30?

6—How do you get the degree on flywheel in timing valves. Do you figure degrees from dead center?—G. W. Arnold.

1 and 6—The proper valve timing for any motor depends upon the design of the engine, but it should be approximately that indicated for the engine whose valve timing was described in answer to G. S. Wittson, New York, in the Readers' Clearing House department of Motor Age, issue of May 14.

2—With a 2½ to 1 gear ratio and 32-inch wheels, the car would travel 76 miles per hour with the motor turning over at 2,000 r. p. m. This is neglecting slippage which probably would cut the speed down to 70 miles per hour. With 2 to 1 gear ratio and 30-inch wheels, the car would travel 86 miles per hour at a motor speed of 2,000 r. p. m., neglecting slippage.

3—If the gear ratio of the car and the size of the tires are known, it is a simple matter to calculate at what speed the car will go at any given speed of revolution of the motor. Suppose we have a car with a gear ratio of 3½ to 1 on high or direct drive, 36-inch wheels and a motor capable of developing its full power at 1,200 r. p. m.; to find the speed of which the car is capable: Each time the wheel turns over, the car travels forward a distance equal to the outer circumference of the wheel. The circumference of a 36-inch wheel is 3.146 by 36 equaling 113 inches or 9.4 feet. To make allowance for slip and compression of tires, say 9 feet. With a 3½ gear ratio the wheel turns over 1/3.5 or .286 times and the car travels a distance of 9 by .286, equaling 2.48 feet per revolution of the engine.

If the engine runs at 1,200 revolutions per minute, the car travels 1,200 by 2.48, equaling 2,910 feet per minute, or 174,600 feet per hour. Dividing by 5,280, the number of feet in a mile, we have 33 miles an hour as speed of the car.

Of course, any one of the other factors can be determined just as easily if the rest are known. For instance, the revolutions of the crankshaft per minute can be found for any speed if the gear ratio and tire size are known, or the gear ratio can be calculated if tire size, car speed and crankshaft speed are known. It is not necessary to make these calculations, for any of these problems can be solved di-

rectly by means of the chart, Fig. 1. The solution of four problems will explain the chart.

Given the miles per hour, gear ratio and tire sizes, find the revolutions of the crankshaft per minute: To solve this select the miles per hour on the left-hand margin. For illustration, suppose the car is traveling at 80 miles per hour with 34-inch tires and a gear rating of 1.5 to 1. From the figure 80, move right to the intersection of the gear ratio line designed as 1.5. From this point move up to the diagonal of 34 inches. From this point move right to the margin where the revolutions of the crankshaft speed per minute are shown; 1,200 in this case.

Given the crankshaft revolutions per minute, the tire diameters and miles per hour, find the gear ratio. Supposing the motor is turning over at 1,000 revolutions per minute, that 42-inch tires are used and the car is traveling at 50 miles per hour. Go left from the 1,000 on the right margin until the intersection of the 42-inch tire-size line. From this point go up to the intersection of the 50-mile-per-hour horizontal line. The intersection of this line also cuts the gear ratio 2.7 line, which is the gear ratio employed.

Given the crankshaft revolutions per minute, size of tires and gear ratio, in order to find miles per hour proceed as follows: Go left from crankshaft speed, say 1,000 revolutions per minute, to tire size, say 28-inch. From this point go up

or down to intersection of gear ratio line, say 1.5. Then go left to 55 miles per hour.

If we have given crankshaft speed in revolutions per minute, miles per hour and gear ratio, the tire sizes may be obtained by going left from crankshaft speed to the intersection of the gear ratio line and thence up or down to the miles per hour, which point will mark the intersection of the required tire diameter.

4—The piston displacement is figured in the following way: The square of the diameter or the bore in inches multiplied by the stroke in inches, then by the number of cylinders, then by .7854. This gives the piston displacement in cubic inches.

5—The piston displacement of the Chalmers 30 is 226.2 cubic inches.

CARBURETER AND DISPLACEMENT

Gas Velocity Figured at Throat—Sleeve
Travel of Knight Engines

Harvey, Ill.—Editor Motor Age—What relation does the carbureter size bear to the piston displacement and gas velocity and at what opening in the travel of the gases is the velocity figured? Kindly give a specific case.

2—What is the sleeve travel, port areas and valve timing of the Moline Knight?

3—What is the clearance between the two sleeves and between the outer sleeve and the cylinder wall of the Moline Knight?—L. L. Cass.

1—The gas velocity is usually figured at the carbureter throat. The carbureter size will vary with the piston displacement, but it is a difficult matter to give any definite formula applicable to all

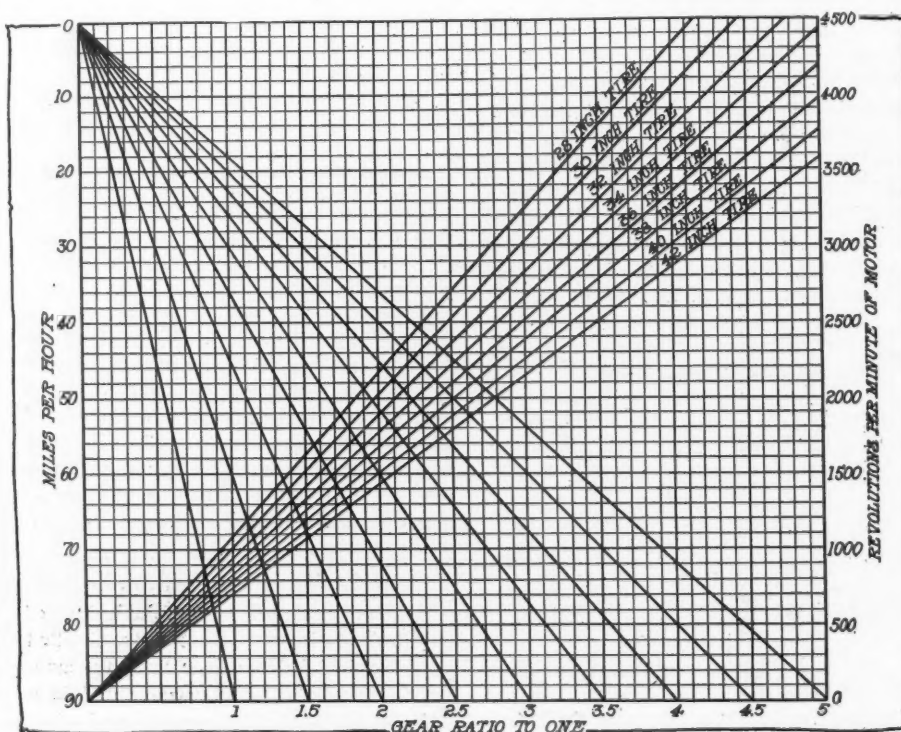


FIG. 1—CHART SHOWING HOW THE SPEED OF A MOTOR CAR MAY BE FOUND IF THE GEAR RATIO, TIRE SIZE AND R. P. M. OF MOTOR ARE KNOWN

makes by which accurate results may be obtained, as to just how the size shall vary. Most carbureter companies experiment in order to obtain the proper size carbureter and nozzle. The volumetric efficiency of the motor has much to do with the carbureter size.

The Wheeler & Schebler company tries to maintain a velocity of approximately 10,500 feet per minute at the carbureter throat, with the motor under full load at 1,600 feet per minute piston speed.

The Holley company uses the following formula for determining the throat size:

$$\frac{D^2LN}{\text{square root of } 150,000}$$

where D is the bore of the motor in inches L the stroke in inches and N the maximum r. p. m. at which the motor will be run when driving the car on direct gear.

In determining the nominal outlet size of the carbureter the denominator 70,000 is substituted in the above equation. Thus a motor with a maximum r. p. m. of 2,000 and with a bore and stroke of 4 by 5 inches would have a $1\frac{1}{2}$ -inch carbureter

$16 \times 5 \times 2,000$
for the square root of $\frac{150,000}{70,000}$ equals
1.517 or a $1\frac{1}{2}$ -inch.

The equation above gives, through the carbureter throat, an actual velocity of between 33,000 and 35,000 feet per minute under wide open throttle and at maximum motor speed.

2—The Moline-Knight sleeve travel is $1\frac{1}{8}$ inches. The intake port area is 1.875 square inches and the exhaust area is 2.34 square inches. The intake opens 20 degrees after top center and closes 50 degrees before bottom center. The exhaust opens 50 degrees before bottom center and closes 5 degrees after top center.

3—This is not obtainable.

TIGHTENING OAKLAND STEERING Method in Detail Given for Kansas Reader—Worn Parts to be Replaced

Lucas, Kan.—Editor Motor Age—Kindly explain how the steering gear on an Oakland roadster 1909 or '10 model 30 horsepower may be tightened.—G. G. Hadlock.

With the assistance of some one to turn the steering wheel, look over carefully the ball joints in the steering connections and adjust them so there will be no excess of lost motion. Examine the bolts in tie rod or distance rod and see that those are not worn. Examine the steering rod arm and see that it is tight on the shaft. The eccentric might be loose on shaft or the steering wheel loose on the column.

If this does not overcome the lost motion, remove the plate from the steering gear housing and examine the gears. If there is an excess of lost motion in the gears they should be replaced, although it is possible only the tail gear will need replacing. Examine also the brass bushings in this housing, which are probably more or less worn, also the eccentric on the steering shaft, which may have too

much lost motion in the tail. If any of these parts are worn they will, of course, need replacing.

Information on the Studebaker

Chicago.—Editor Motor Age—How does one start the electric cranker on a Studebaker six?
2—How are the different speeds arranged?
3—Has this car a cutout?
4—How fast will the car go when wide open?—A Subscriber.

1—By pulling a handle on the steering post.

2—The change-speed quadrant of the Studebaker six is shown in Fig. 2, with the shifter lever in the different speeds. For the first speed the lever is pulled into slot and backwards for second into the outer slot and forward and for third or high into the outer slot and backward, as the illustrations show. Reverse is in the inner slot forward.

3—A cutout is not standard equipment.

4—Over 50 miles per hour.

EXPLANATION OF IGNITION SYSTEM

Battery and Non-Vibrator Coil Type Outlined—Axle on Maxwell

Taylor Falls, Minn.—Editor Motor Age—Kindly explain the ignition system in which a battery, non-vibrating coil, breaker box and distributor are used.

2—Is this system used on many cars and is it very reliable? What are its disadvantages, if any?

3—Is kerosene a non-conductor of electricity, and does it not affect the ignition if a drop of it is placed on the platinum points of the vibrator?

4—What type of axle has the Maxwell 25, and do the bearings come in direct contact with the axle shafts or are sleeves placed on the shafts to receive wear?—A Subscriber.

1—In transforming the battery current, which usually is 6 volts, to a current of sufficiently high voltage to jump the spark gap, a transformer coil, usually called a spark coil, is used. In a transformer the increase in voltage depends upon the rapidity with which the primary current is changed. In the direct current coming from the battery there is little change, the current being practically constant in the primary coil. The vibrator is put in the circuit to very rapidly make and break the primary circuit, thus giving the variation in the primary necessary for the transformer action. With the non-vibrating coil, however, some other means must be used to replace the vibrator, this means the breaker box. The only real difference between the breaker box and the vibrator is that in the former the primary circuit is made and broken by mechanical means while in the vibrator this is accomplished by electro-magnetism. The making and breaking of the primary circuit by the breaker box consists of quick interruptions in the primary coil, which in turn set up a high voltage in the secondary coil. The

current at this high voltage is led through a single wire from the coil to the distributor, from which it is directed to the proper plugs. The return circuit is to the coil through the ground.

2—This system is employed on a number of cars in connection with the low-tension magneto system, such as the low tension Splittdorf. The non-vibrating battery system alone is not used regularly.

3—Kerosene, though not as good a conductor of electricity as most metals, is not an insulator in the strictest sense and the very thin film of it on the vibrator points is not likely to offer as much resistance to the passage of the current as the dirt it is put there to remove.

4—The Maxwell 25 has three-quarter floating axles, in which the wheel bearings are on the outside of the axle housing.

Proper Tire Size

Clarkson, Neb.—Editor Motor Age—What size tire should be used on a car weighing 3,600 pounds? I am using 36 by 4-inch casings.

2—What is the proper inflation of a tire of standard make, for a car weighing 3,600 pounds?

3—What pressure will a tire 36 by 4 stand?
4—How much more wear will a person get out of an oversize tire for the above car, say a tire 37 by 4 $\frac{1}{4}$?—A Reader.

1—36 by 4 $\frac{1}{4}$ -inch tires should be used.

2—Ninety pounds is the proper inflation pressure of a tire of standard make.

3—From 110 to 200 pounds. It depends on the tire.

4—Almost proportional to the difference in price of same make.

Tire Paint Formula

St. Louis, Mo.—Editor Motor Age—Give a formula for making white paint to use for tires.—C. H. Andrews.

The constituents of the average tire paint are: rubber cement, a metal oxide such as zinc or lead, a little linseed oil and a dryer of some sort.

Questions Answered and Communications Received

G. W. Arnold.....Kansas City, Mo.
L. L. Cass.....Harvey, Ill.
G. G. Hadlock.....Lucas, Kan.
A Subscriber.....Chicago
C. H. Andrews.....St. Louis, Mo.
A Subscriber.....Taylor Falls, Minn.
A Reader.....Clarkson, Neb.

No communication not signed with the reader's full name and address will be answered.

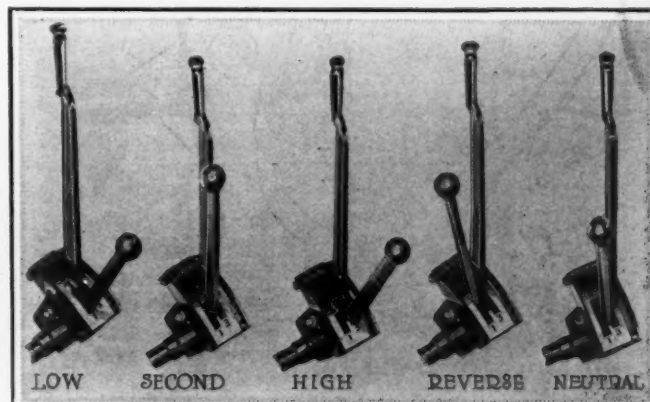


FIG. 2—HOW THE STUDEBAKER FOUR GEAR CHANGES ARE MADE



Cyclecar Development

European Motors for Cyclecars

NO cyclecar motor abroad has made a better record than the Coventry-Simplex twin-cylinder water-cooled motor shown in the illustrations. This motor with vertical cylinders and a two-throw crank-shaft has come in first in almost every reliability contest held in England. It pulls a car weighing more than the American cyclecars—the G. W. K. friction drive side-by-side, and is a smaller motor than we use here, but has proved that it can take the car anywhere and back.

In the A. C. U. 6-days' trials last year three G. W. K.'s entered and the three went through with perfect scores, the only team to do so. In the 6-day Scottish cyclecar trials, the most severe test ever run in England for small vehicles, the Coventry-Simplex motor pulled the only cars with perfect scores, and in many other contests the same has been repeated. This would indicate that the type of motor is right for reliability.

A number of cyclecar firms are using motors of this type, twin vertical water-cooled motors with double-throw cranks and refined workmanship, and have proved that for light cars they have great ad-

vantages, volumetric efficiency being high, and vibration being almost absent. America waits for some American motor builder to build a similar motor of 71-inch capacity limit, for there is great need for just such a simple plant at a low figure.

The drawings show the motor in detail. The bore is 3.39 inches or 86 millimeters, and the stroke 3.62 or 92 millimeters, which gives it a rating of 9 horsepower, though it really turns up about 20 at its best. It is meant to run at 1,500 r. p. m. and weighs, including magneto and carbureter—but without radiator or water—120 pounds. The foreign price is about \$250 but a similar motor could be built here for around \$30 and sold for not over \$60 complete, and without sacrificing any workmanship. England ordinarily makes things by the piece and not by quantity.

The valves are arranged in ordinary L-head fashion and are as large as space will permit with this arrangement. They are operated in the ordinary manner from a camshaft in the base. The inlet manifold is integral with the cylinder casting, the exhaust bolts on separately.

The crankshaft is of the two-bearing type and runs on very large ball bearings, the shaft itself being very large and stiff to prevent the

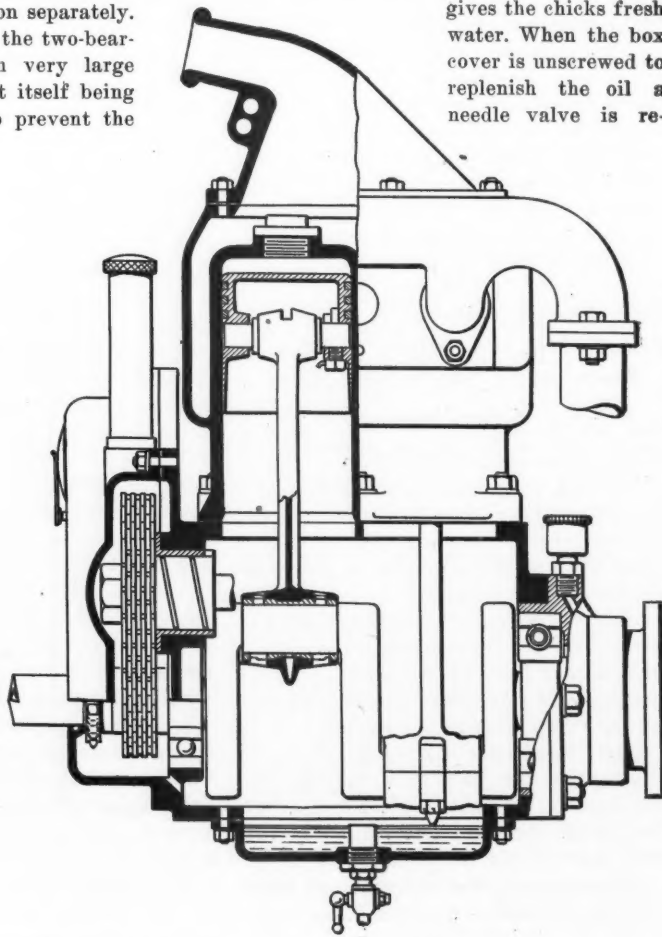
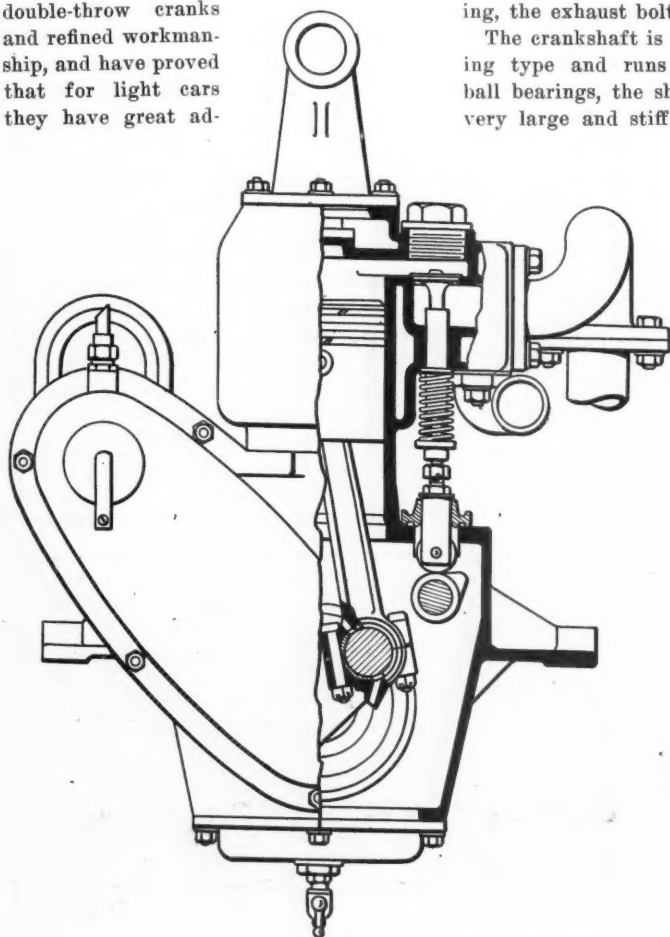
vibration of distortion. Thermo-siphon circulation is employed for cooling and in the general construction the motor follows four-cylinder practice.

The motor is perfectly balanced mechanically and uneven firing is no more noticeable than in the ordinary V twin, the flywheel taking up the unevenness which is very little in high speed work.

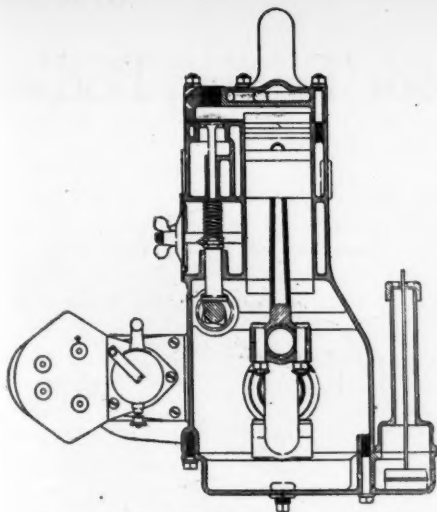
The illustrations show a similar motor used on the Swift cyclecar of England. This motor has the same general arrangement, but with different details. It has the valve tappets inclosed for silence and runs on plain bearings, a thing to be commended for cyclecar work where the noise of ball bearings produces a continual rumbling at speeds. Plain bearings are silent.

An interesting oiling system is used on the motor shown, the oil being carried on a cast box on the side of the crankcase, this box being air-tight. A pipe leads to the base and opens at oil level. If the oil gets below this level air can enter the pipe and allows more oil to flow down like

a chicken feeder gives the chicks fresh water. When the box cover is unscrewed to replenish the oil a needle valve is re-



THE COVENTRY-SIMPLEX TWO-CYLINDER CYCLECAR MOTOR USED ON THE G. W. K. CYCLECAR



GADABOUT FOUR-CYLINDER MOTOR

leased that cuts off the flow until the cover is replaced. The Swift motor has a 2.95 inch bore and a 4.33 inch stroke, or 75 by 110 millimeters.

Other motors of this type are made by the Alpha Engine Works, and the Dorman Engine Co., in England, while the Violet-Bogey semi-tandem car in France uses a vertical twin also.

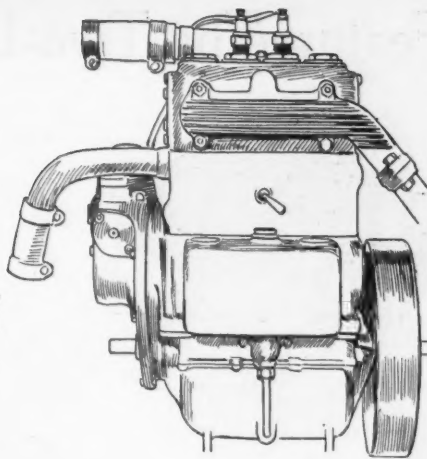
Besides these motors there are several V-twins water cooled, the Jap, being used on the Morgan, and the Blumfield and Buckingham on several other cars of the light European type.

NEW GADABOUT CYCLECAR MOTOR

A very interesting four-cylinder water-cooled motor is being used in the Gadabout cyclecar, a motor within the cyclecar definition, as its bore and stroke of $2\frac{1}{2}$ by $3\frac{1}{2}$ give it a total displacement of 69 inches. A section of the motor is shown in the illustration.

The crankshaft is of the two-bearing type, the four cylinders being cast in block together with the whole of the crankcase. The cylinder head casting is separate, enabling one to get at the valves easily, but the intake and exhaust passages are a part of the cylinder casting. The valves are all inclosed to prevent noise and operate on the mushroom principle.

The main shaft is mounted on two ball bearings, the crank-pin bearings being $1\frac{1}{8}$ by 1 inches in size, while the connecting rods are 7 inches long. The



MOTOR USED IN ENGLISH SWIFT CYCLECAR

piston is $3\frac{1}{8}$ inches long and fitted with two rings. The valves have a $\frac{7}{8}$ -inch clear opening and a $\frac{1}{8}$ -inch lift. Thermosiphon cooling is employed. Ignition is by magneto on the left side of the motor. The motor takes a $\frac{3}{4}$ -inch carburetor.

ANOTHER IMP PLANNED

The Imp cyclecar is to be made in a new model, fitted with a four-cylinder motor, and a shaft-friction drive as on the Robie and Twombly cyclecars, the final drive being by chain. Tandem seating is retained, as are the general features of the Imp as already known but with the improvements found necessary. The rear axle is fitted with a gearless differential, and the propeller shaft has a double universal action. Cantilever springs are fitted at the rear to take care of the new drive. The weight of the car, it is said, will be 750 pounds, and the test car is now on the road. The price of the new model will be \$395. Deliveries on the new model will begin at an early date.

TWIN CITY HAS PISTON VALVES

A new cyclecar, known as the Twin City, has just been announced by C. H. Scholer, of Minneapolis. This car is a 36-inch tread side-by-side car with a 101-inch wheelbase. It is fitted with a four-cylinder motor, $2\frac{1}{2}$ by $3\frac{1}{2}$ inches in bore and stroke, and air-cooled. The motor has piston valves and is said to work very satisfactorily. From the motor the drive is by shaft to a friction gearset, from

whence a chain takes the drive to a solid rear axle.

The frame is made of hickory, and is very stout and resilient. The springing system is original, consisting of transverse coil springs, seen in the front view of the car, the four springs being interchangeable, and it is stated that a whole spring costs less than a single leaf of the ordinary type springs.

The fender system is interesting, entrance is easy and the rear fenders act as arm rests for the riders. The car has been driven several hundred miles over Minnesota roads. The car is to be manufactured by the Twin City Cyclecar Co. and will sell for \$425, complete with equipment.

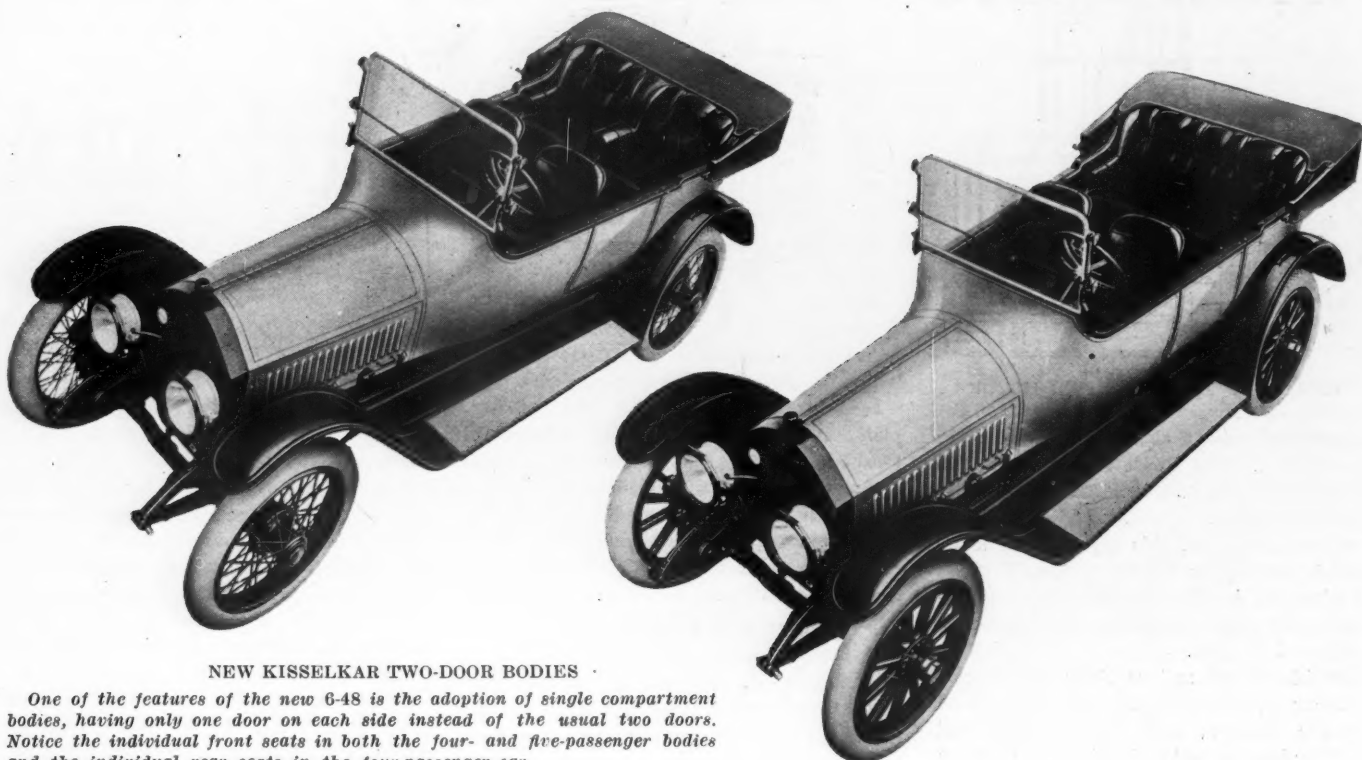
BILLIKEN GOING TO DE PERE

DePere, Wis. has subscribed practically \$25,000 to secure the Milwaukee Cycle Car negotiations will be completed before the Co. for DePere, and it is expected that end of May. Interesting news concerning the plans of the Milwaukee company were disclosed during the mass meeting held in DePere. The concern produced the Billiken cyclecar, designed by Stanley H. Eigel, but intends to change the design to make the car a full-fledged motor car instead of a cyclecar in the accepted sense of the word. The guage will be standard, or 56 inches. Figures adduced show that the net cost of production will allow reasonable profit at the selling price of \$395. The proposition has been found very satisfactory by DePere capitalists.



REAR AND SIDE VIEW OF THE TWIN CITY CYCLECAR

New Kisselkar Six Featured by Two-Door Touring Bodies



NEW KISSELKAR TWO-DOOR BODIES

One of the features of the new 6-48 is the adoption of single compartment bodies, having only one door on each side instead of the usual two doors. Notice the individual front seats in both the four- and five-passenger bodies and the individual rear seats in the four-passenger car



NEW 6-48 SEVEN-PASSENGER KISSELKAR

The streamline effect by means of the smooth, rounding cowl is obtained in this as well as in the four- and five-passenger cars

UNUSUAL body design and greater accessibility are the features of the new six-cylinder model just announced by the Kissel Motor Car Co., Hartford, Wis. This new six-cylinder car will be a part of the 1915 production. As to the other chassis models, the Kissel company is not yet ready to give out the details.

Novel Seating and Doors

Adoption of a two-door, single-compartment body as a standard design is the unique feature of the six, which is to be known as the Series B-48 six. This design is applied to the four and five-passenger cars and gives a very smart appearance to them. The two-door single-compartment body is made possible by the employment of individual chairs for the driver and his side passenger. This permits the use of a single door on each side of the body which

gives entrance to both the front and rear seats so that there are two doors to the car instead of the usual four doors. The five-passenger car differs from the four-passenger only in the division of the rear seat into two seats by the use of a wide arm rest in the case of the four-passenger cars. Where the standard type of four-door body is desired it may be obtained as an option.

It is not expected by the Kissel company that there will be many orders for the ordinary type in preference to the new design inasmuch as the latter was not made standard without a thorough sounding of public opinion. According to the company, this was accomplished by the building and distribution among a few leading dealers of a sample lot of cars which were placed on the salesroom floors without advance exploitation of any kind. So many special

NEW FEATURES OF SERIES B 48-SIX KISSELKAR

Streamline design

Two-door single compartment with individual seats—optional

Seven-passenger body with disappearing seats—optional

Six-cylinder 4 by 5½-inch block motor

Construction permitting removal of push rod and guide without lifting cylinder from crankcase.

Centralized control panel on dash, making all wires easily accessible and permitting removal of body without cutting a wire
Elimination of side lamps

orders were received by the factory from every point at which these cars were shown that the indications of general favor were believed unmistakable.

It is the Kissel belief that this arrangement will universally supplant the four-door type. If this should prove to be the case, it will be a signal triumph for the Kissels, as there can be no question raised as to priority in the introduction of this innovation.

The new two-door body has the streamline idea very thoroughly worked out with

an unbroken surface from the bow of the bonnet to amidships. Side lamps are eliminated and the door openings are 26 inches wide, a feature which will be particularly appreciated by women.

Between the individual front seats is an aisle, 8 inches in width, which allows passage to and from the rear seats, and permits an exchange of seats without leaving the car. The upholstery is 11 inches in depth and the lining throughout is of leather. To those preferring a four-door body, two models are offered, one for five and one for seven passengers. In these, the streamline idea also appears and two of the seats of the seven passenger style can be folded and put out of the way when not in use.

The New Motor

The power plant of the new six-cylinder car consists of a new 4 by 5½-inch motor, a leather-faced cone clutch, and a four-speed gearset with direct on third. The motor has block-cast cylinders of the L-head type and unusually large valves. A new feature of note is the position of the push rod, which is clamped inside of the valve inclosure. Instead of being pressed into the cylinder, the guide as well as the rod is accessible for removal without lifting the cylinder from the crankcase. The Stromberg carburetor is employed. It is fitted with a water jacket and has an air inlet shutoff for starting in cold weather.

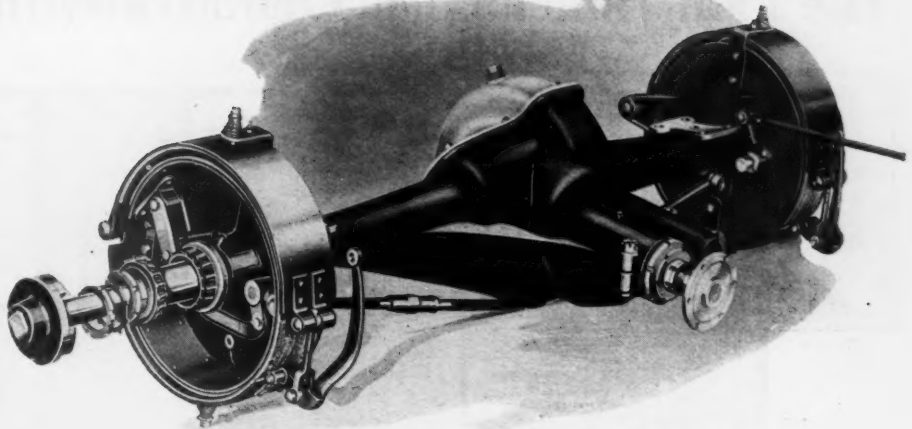
The lubrication of the engine is by force-feed through drilled crankshafts to all bearings. The oil is supplied from a self-contained reservoir and is drained back from the pistons to prevent smoking and carbonizing. A Mayo radiator of the Mercedes type with a belt-driven fan is used in connection with the centrifugal pump for cooling. The Kissels are quite proud of the fact that the engine is cast and built entirely in the Kissel plant, also of the fact that Holy hill and Kelly hill, on which all Kissel cars are tested and which are said to be the most difficult grades in the state, are taken easily on high on the new car.

Centralization of Wiring

The clutch has adjustable spring inserts and is arranged to be adjusted without disturbing any other part. Between the clutch and the gearset is a universal and Spicer joints are provided on the drive shaft between the gear box and the differential.

Another feature is the centralization of all the electric wires on a control panel attached to the front of the dash. Through this construction wiring trouble can be located readily and usually repaired without disturbing any unaffected parts. Of equal importance is the fact that the body can be removed without cutting a wire.

Left drive and center control are retained as well as the Kissel electric cranking system, which is operated by a foot plunger. Cranking, lighting and ignition are accomplished by separate units. In-



AXLE AND BRAKE ARRANGEMENTS OF THE NEW KISSEL 6-48

A noticeable feature is the very substantial appearance of the internal brake arrangements

stead of side lights a dimming attachment for the headlights is adopted, such that the latter consume only half the power when they are dim as they do when brilliant. The entire power plant, which is a unit, is supported on a special sub frame with bearings in front, in the rear, and on either side.

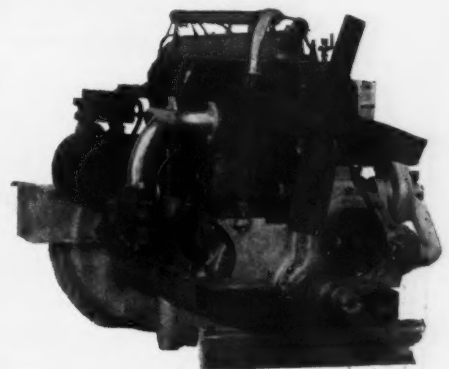
Rear springs are three-quarter elliptic and hardened steel bushings are used to carry the eye-bolts. The foot brakes contract on the rear wheel drum, which is 14 by 5 inches in size. The emergency brakes operate within these drums. The axle is of the floating type and runs on roller bearings.

All indicating and operating instruments are mounted on the cowl in a straight line and illuminated at night by lamps concealed under the cornice. The fuel tank is in the rear and holds 24 gallons. Upon the latter is a gasoline gauge which has the commendable feature of being illuminated by a bullseye in the tail lamp.

The equipment of the 48-6 includes Golde patent one-man top, ventilating, rain-vision windshield, which is built into the body. Solar head and tail lamps, Warner speedometer, Klaxet horn, and robe and foot rails, as well as the regular outfit of tools and so on. All open bodies mounted on this chassis are quoted at the same price, \$2,350.

BODY BUILDER IN TROUBLE

Suit asking that a receiver be appointed for the Auto Specialty Mfg. Co., of Indianapolis, has been brought in the superior court by Charles O. Wiggins, a director and stockholder, who says the company owes him \$375, represented by a promissory note for that amount dated August 15, 1912, and payable on demand. Wiggins says the company has liabilities of \$7,000 and assets of \$12,000, but is without ready cash to carry on business. He says there are orders on hand amounting to \$3,000 and that about \$100 worth of materials will be needed to get out these orders. He says the orders can be filled in about 3 weeks and that they will net about \$500 profit. The court is asked to



KISSEL 6-48 MOTOR

Magneto and water pump are mounted cross-wise of the engine upon either end of a transverse shaft. This permits unusual accessibility of these parts

arrange to continue the business until the orders are finished. The company manufactures bodies, foredoors and other specialties.

ANOTHER IMP PLANNED

The Imp cyclecar is to be made in a new model, fitted with a four-cylinder motor and a shaft-friction drive as on the Robie and Twombly cyclecars, the final drive being by chain. Tandem seating is retained, as are the general features of the Imp as already known but with the improvements found necessary. The rear axle is fitted with a gearless differential, and the propeller shaft has a double universal action. Cantilever springs are fitted at the rear to take care of the new drive. The weight of the car it is said will be 750 pounds, and the test car is now on the road. The price of the new model will be \$395. Deliveries on the new models will begin at an early date.

NEW OIL COMPANY

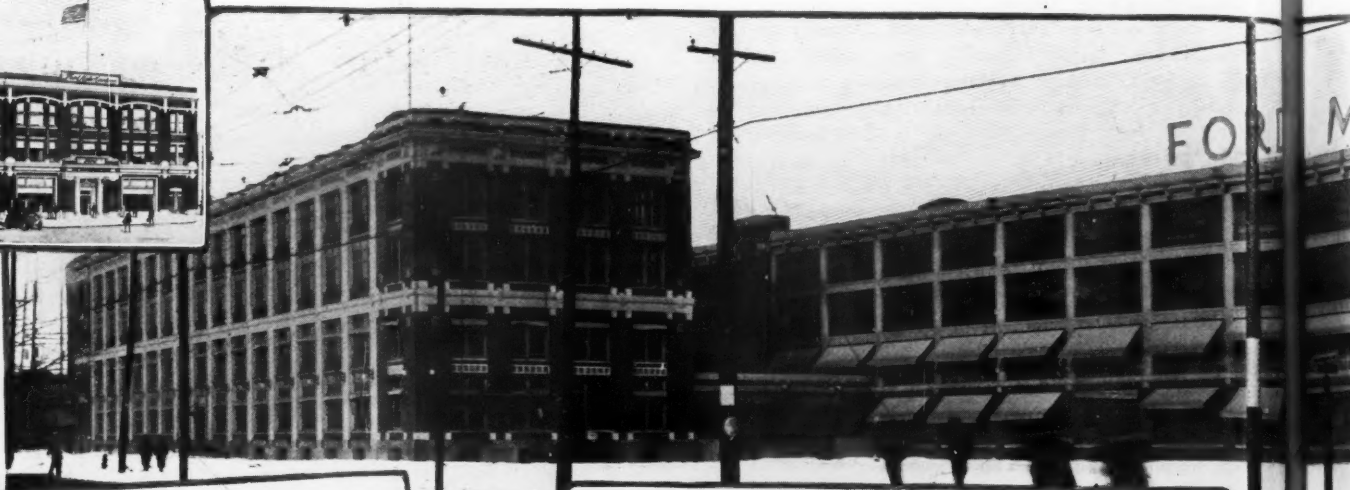
The Wisconsin Oil and Supply Co., Milwaukee, organized recently with \$15,000 capital, has established headquarters and tanks at 2609-2611 Elm street and is marketing oils and greases under the trade name of Wosco. P. J. Klumb has been elected president; C. Weckmueller, vice-president, and H. H. Gerlach, secretary and treasurer.

The Home Factory at Detroit and the Assembly Plants



2

1



3

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5



6

FORD FACTORY AND THE COMPANY'S COMBINED

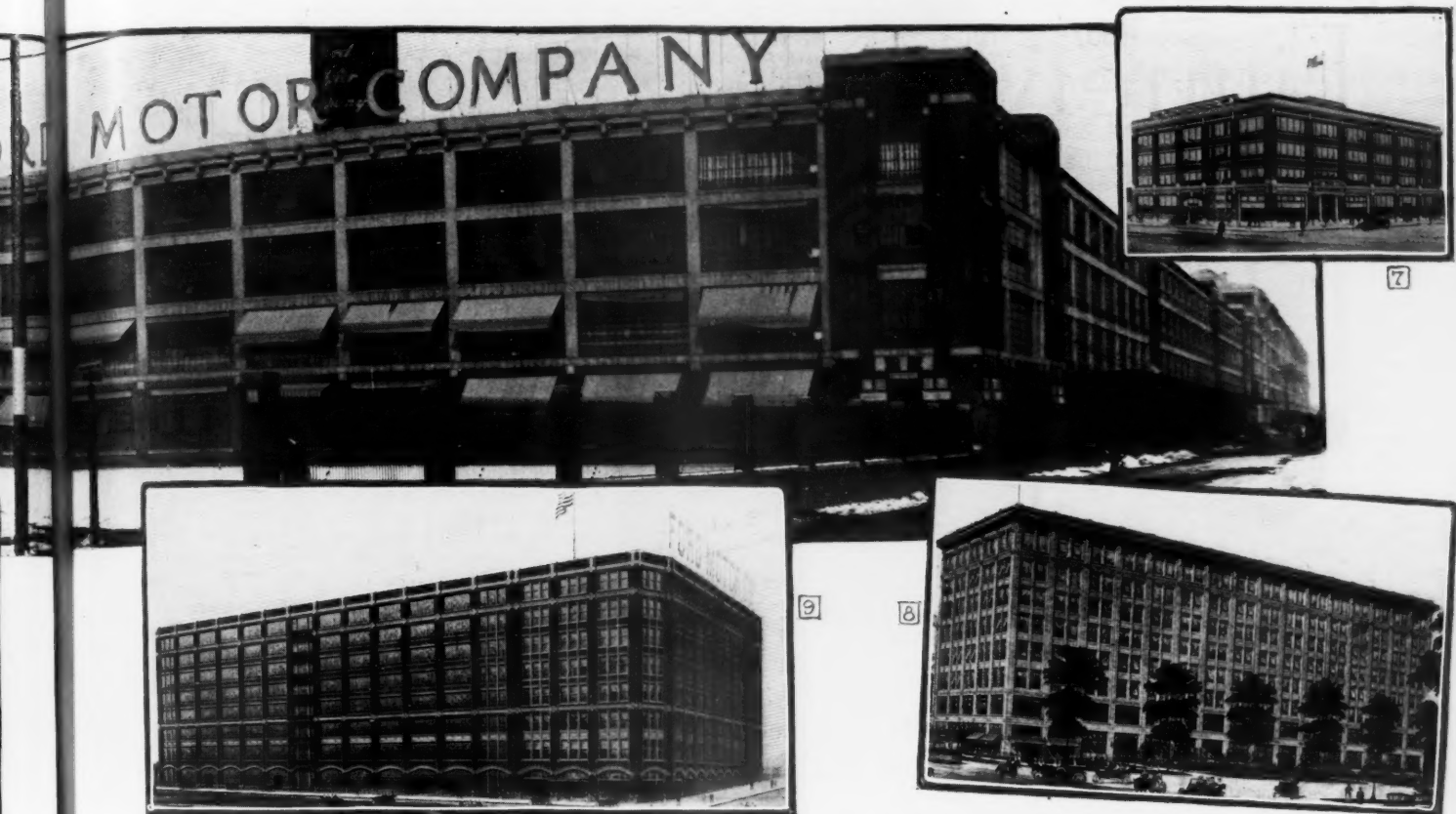
- 1—The parent factory at Highland Park, near Detroit.
- 2—The service building and assembling plant at St. Paul, Minn.
- 3—Nine-story building at Philadelphia, Pa., where the cars are assembled.
- 4—Assembling plant and service building at Chicago.
- 5—The New England territory is served from this plant at Cambridge, near Boston, Mass.
- 6—Missouri and nearby territory is catered for by this plant at St. Louis.

PERHAPS in no better way can the magnitude of the Ford production and the market that it creates incidentally for Ford accessories and Ford specialties be illustrated than in the illustration on these pages. About the home factory at Highland Park, a suburb of Detroit, are grouped twelve of the fourteen Ford assembling plants and service stations. These include the plant at Long Island City, N. Y., which serves greater New York and its surrounding territory, the Boston plant, which takes care of the New England field, and plants at Philadelphia, Chicago, Detroit, St. Louis, Portland, San Francisco, St. Paul, Seattle and Denver.

The establishment of these assembling plants is a step in the extension of the Ford company's system of distribution. By this system the cars are shipped disassembled, which permits a larger number of cars to be loaded in a freight car than if they were completely assembled. The saving of freight charges by this method is one of the many efficiency methods of manufacturing and distribution employed by the company by which low costs and thus low prices are obtained.

Ford owners will be interested in some of the financial figures connected with the manufacture of their car. During the 10 years from the time the company started in 1903 to the close of 1913, it sold \$205,

Part of Distribution System that Makes Market for Ford



SERVICE STATIONS AND ASSEMBLING PLANTS

7—The Rocky Mountain section is served from the assembling plant at Denver, Colo.

8—In addition to the parent factory, an eight-story service station is maintained in Detroit, Mich.

9—At Long Island City, N. Y., is the assembling plant for Greater New York.

10—The far northwest is served from this plant, Seattle, Wash.

11—The Pacific coast is cared for from San Francisco from this building.

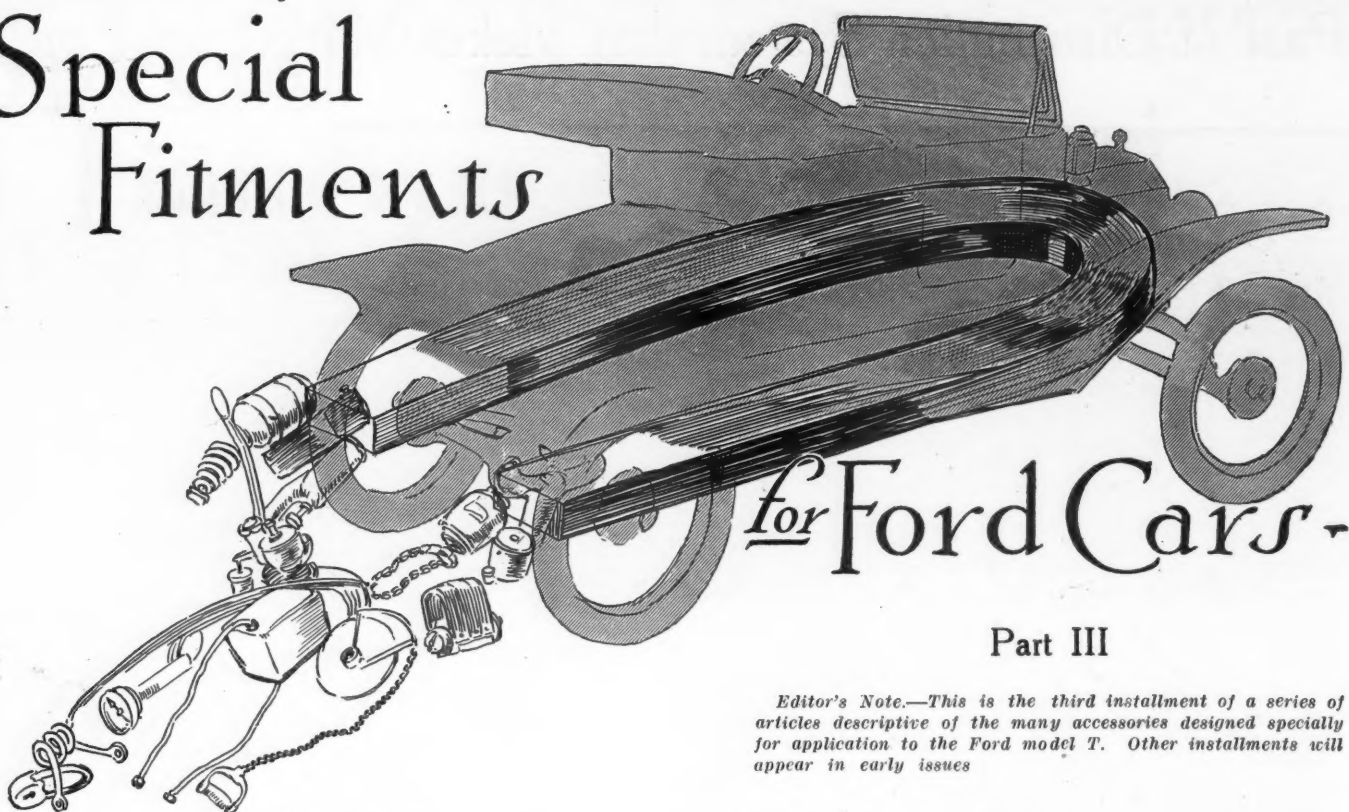
897,625 worth of cars and retained net profits of \$60,406,832. For 1913 alone the profits were \$25,000,000 and it is expected that the current season will do as well if not better. By the new profit-sharing system which the Ford company recently has inaugurated, the workmen will get half of the profits, whatever they amount to.

This year's production of Ford cars will require about 1,250,000 tires, according to a recent estimate made by the officials of the Ford Motor Co. This indicates that the plant will turn out 312,500 machines for the current season. The tires will be supplied by four of the leading American tire makers.

Figuring on a basis of 1,000 cars a day, 120 must be completed every hour or two every minute of an 18-hour shift. Two hundred and fifty men are employed in the assembling department and each man completes four cars a day. These men handle an aggregate of 500,000 tons of material daily, consisting of 4,000 tires, 1,000 gallons of gasoline, 1,000 pints of oil, 5,000 pounds of grease, 3,000 gallons of water for the radiators, 2,000 springs, 5,000 lamps, 48,000 wheel spokes and 200,000 cotter pins. In the course of the year the output absorbs, in addition to other material, over 1,000,000 lamps, 800,000 wheels and tires and some 600,000 pounds of hair for upholstering.



Special Fitments



Part III

Editor's Note.—This is the third installment of a series of articles descriptive of the many accessories designed specially for application to the Ford model T. Other installments will appear in early issues

Inclosed, Convertible, Commercial and Racing Bodies

SPECIAL bodies for Ford cars have proven attractive to owners, particularly the enclosed type of bodies by which the occupants of the car may be protected from the weather to a greater extent than is possible with the conventional storm curtains. These

appear in two forms, either the complete inclosed body or the convertible type which may be changed at will and with which the sedan or limousine tops may be classed. Racing bodies and those for delivery purposes also are popular.

Irvin Robbins & Co. offers two types of enclosed bodies, both of the two and three-passenger type. One of these is the conventional coupe body and the other a landaulette-coupe, a convertible body which may be transformed into either an open or a closed car at will. The materials and finish are of a quality that compare favorably with Robbins bodies for larger cars, and the construction is as light as consistent with durability. No expert is required for the installation and the job will not require over an hour, it is stated. The front partition of the coupe fits over the old dash and the irons and bolts are the same as on the old body. The bodies seat two on the main seat and one on an auxiliary folding seat in front. They are wired with lamps and switches for lighting from the magneto. The rear deck is roomy enough to take care of a spare tire as well as tools and luggage, and has a lock.

Under the catchy name of the Limousette, the Mandel Limousine Co., Chicago, is making a limousine superstructure for Ford touring cars and roadsters by which the open car can be converted into a closed one in 1 hour. It adds only 75 pounds to the weight of the car after stripping the top, windshield and fittings, and weighs altogether only 150 pounds, it is stated. It is made to fit all models down to and including 1912. It can be put on by two or three men and is held in place by the touring top bolts. The limousette is of colonial design and gives a very graceful and distinctive touch to the car. The doors are designed to swing with the touring doors, opening

and closing being effected by a single handle. The underside of the roofing is in dark broadcloth and the windows slide in mahogany frames. For touring cars the limousette sells at \$150 and for roadsters \$100.

A convertible touring body for Ford cars is the Lewkowics, manufactured by the Convertible Automobile Body Corp., New York. It is simple in operation and can be converted from a touring body to a completely enclosed one in less than 1 minute, it is stated. The windows drop into casings on the side of the car as in an ordinary limousine. It is fully waterproof and the entire sides are glass. Sedan bodies of distinction are made by the Willoughby Co., Utica, N. Y.

Commercial bodies for fitting on the Ford

chassis are manufactured by the Highland Body Mfg. Co., Cincinnati, O. Among the special truck bodies are a full panel body and open express, a box body to be mounted on the rear of the roadster seat, and a small flare board for similar installation. Bodies for all commercial purposes and designed for fitting to the Ford chassis are made by the Auto Remodeling Co., Chicago. This concern also supplies roadster and touring bodies, the former at \$40 and the latter at \$80, the price including top and side curtains.

Commercial bodies in a number of types for the Ford car are made by the London Limousine Co., Inc., Hempstead, N. Y. The five types include metal panel, wood panel, curtain, stake and express bodies. Prices range from \$50 to \$100.

For those who wish to transform their cars for racing or to give it a speedy and sporty appearance with a racing body, special constructions are offered by the Auto Sheet Metal Works and the Auto Remodeling Co., both of Chicago.

Those who wish to modernize their Fords of early vintage by the installation of fore doors are offered aluminum fore doors, easy to apply, by the Detroit Fore Door Co., Detroit.

Special mahogany finished body molding cut to proper size and shape for Ford cars together with the necessary screws and finishing washers are supplied by the Consumers' Auto Supply Co., Chicago. For touring cars the set of moulding sells at \$2.25 and for torpedoes at \$1.75. This company also carries rubber mats cut to fit the regulation borders and open-



MANDEL LIMOULETTE TOP INSTALLED

ings and reinforced at the heel. These sell at \$2.

The F. E. Lortz Co., Chicago, manufactures a number of special bodies, among them a coupe

which replaces the stock body. Another is a small open two-passenger body suitable for racing. In commercial bodies this concern makes five different delivery types. Racy-type fuel and oil

tanks and a special bonnet are among the productions of the Lortz company. There is also a coupe top which lists at \$90 made by this concern.

Trailers, Trunk Racks and Other Ford Touring Accessories

ANYONE who has toured through the mountains during the summer months and particularly in California, has noticed the large numbers of camping parties on the roads and has remarked the large percentage of Fords loaded down with campers and camping equipment. Many of the cars themselves are loaded down with

passengers, while hitched on behind the car is some sort of two-wheeled trailer carrying the tent and the bulk of the other paraphernalia. Some of these trailers are crude homemade affairs while others are well adapted to their purpose for family jaunts to the woods.

The Sherwood Bros. Mfg. Co., Canasota, N. Y., is offering a trailer which may be attached to any make of motor car and is especially adapted for Fords. The trailer is a two-wheeled, rubber-tired affair with a capacity of 600 pounds, and is equipped with Timken axles and bearings. The trailer weighs 300 pounds. Connection of trailer may be made in 1 minute, it is claimed by the manufacturers.

A trunk rack specially designed for Ford cars is marketed by the Auto Parts Co., of Chicago. It is fastened on the lower sill of the body and is fitted with special arms on the end of which clamps are fitted for attaching around the goose-neck top rest. When not in use it may be folded back against the body. It is of the double folding type so that part may be folded back. It is 30 inches long and 18 inches wide and sells for \$2.25.

For cold weather motoring the Motorist Warm Grip Co., Marshall, Tex., has a special electrically heated steering wheel grip which gets its current from the magneto. The outfit costs \$7.50.

Floor Mats and Pedal Grips

Floor mats cut to the proper shape have found a ready market, and F. A. Mayo & Co., Boston, Mass., have produced one built of



AUTO PARTS POINTED RADIATOR

rubber on a heavy foundation of duck. This is intended to prevent any chance of tearing. It is furnished with an inlaid heel piece and is not liable to curl up. It is listed at \$2.50.

The American Auto Supply Co. has special rubber mats at \$2.

As its name implies, the specialty of the Auto Pedal Pad Co., New York, is pads for pedals. Special ones for Fords are made for either the clutch or brake. The upper surface has deep corrugations and the pad is mounted on a steel base for quick attachment without drilling. The Auto Parts Co. has soft rubber pads attached by clamping steel strips around the pedals. A set of three sells for \$1.

The American Auto Supply Co., Chicago, markets pedal grips specially made to fit Ford pedals to prevent the feet from slipping at critical moments. These are of rubber, reinforced with a steel plate fitted with a slotted receptacle for the bolts to permit adjustment to any desired position. They sell at 45 cents.

The Auto Parts Co., Chicago, markets rubber mats for Fords at \$1.50. The Metallic Automobile Matting Co., Rochester, N. Y., manufactures the Pyrama aluminum heel plates which are intended to be attached to the rubber mat for its protection where the heels rest. These are listed at 50 cents a pair and can be attached in 5 minutes. No screws are needed, as small projections on the corners clamp under the mat. The company also manufactures the Pyramid aluminum matting which replaces the rubber mat.

Radiators and Caps for Fords—Reference Books

TO provide greater radiating surface than is offered by the stock radiator, and incidentally to give the car a distinction not possessed by others, the Auto Parts Co., Providence, R. I., has brought out a V-shaped radiator made in such a manner as to fit the car without any alterations with the exception of lengthening the starting crank. It is claimed to have a honeycomb core, which with the efficiency gained by having the cores on an angle has double the efficiency of the ordinary radiator, it is said.

Increase in efficiency is the claim made for the It sells for \$32.

Honeycomb radiators for Fords are made by the Detroit Radiator and Specialty Co., Detroit, Mich.

The Fedders Mfg. Co., Buffalo, N. Y., has just brought out a radiator especially designed for Ford cars. It resembles the other Fedders radiators in its construction and it is designed for high efficiency. In addition, the core is made much deeper than is actually necessary so that the motor will cool properly even under extraordinary conditions. The new radiator can be installed with a minimum of trouble, it only being necessary to unbolt the old radiator and attach the new. The retail price of the Fedders-Ford is \$35.

A honeycomb type of radiator for Ford cars is manufactured by the Eureka Auto Parts Mfg. Co. It is called the Eureka diamond honeycomb radiator. It is composed of zigzag water passages, or flat, wide ribbon-like ducts or tubes, leaving diamond-shaped air passages between. Every 1/4 inch—measuring

across the face of the radiator core—is a wide but thin ribbon of water zigzagging from top to bottom through these ducts so that good cooling is a chief claim.

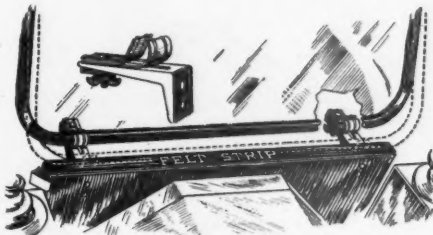
Radiator Caps

Most Ford owners have experienced the discomfort attending the removal of the radiator cap, particularly when it is hot. There have been several special caps brought out with which short handles are incorporated. The most elaborate of these is that of the Boyce Motometer Co., New York, in which a special type of that concern's temperature indicating instrument is incorporated. It sells at \$5.50. The L. P. Halladay Co., Streator, Ill., has special handles for the caps in brass and nickel at 90 cents and \$1. Fancy radiator caps are made by the Illinois Brass Mf. Co., Chicago. This concern also turns out other Ford specialties, among which are cast brass hub caps and rain-vision hinges, which may be attached to the windshield. R. F. Miners, New York, is marketing a special cap for Ford radiators.

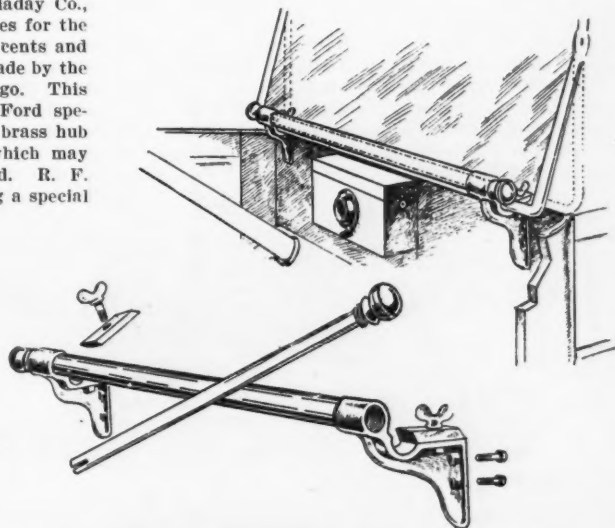
The Auto Parts Co., Chicago, markets special radiators for Ford cars in two types. One of these is a flat radiator of the conventional shape of Mercedes honeycomb section, listed at \$50. The other is a special V-type finished in either brass or nickel, the former at \$65 and the latter at \$70. With each radiator a new starting crank, 5 inches longer than the old one, is furnished.

Reference Books for Ford Owners

A reference manual devoted to the model T is offered by Ford Reference Book Co., New York, and Clerk Sales Co., Peoria, Ill., both at \$1.



SECURITY WINDSHIELD VENTILATOR



DAD COMBINATION VENTILATOR AND ROBE RAIL

Special Ford Oils, Greases and Lubricating Systems

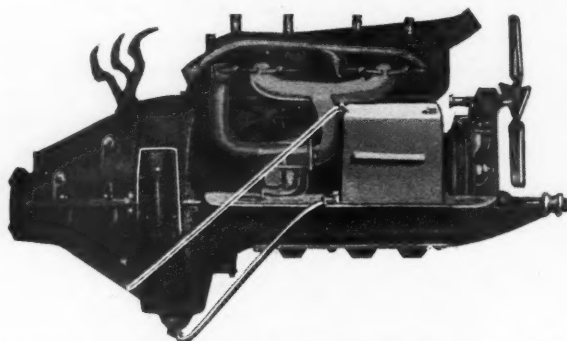
ONE of the things about the Ford car that takes considerable watchfulness on the part of the driver is the lubrication of the engine. One is apt either to run the risk of having too little oil or too much, which causes smoking and carbonization.

To automatically keep the proper level in the crank case and incidentally carry a much greater supply in the engine base, the Danver automatic auxiliary oiler has been brought out by A. C. Danver, Pawtucket, R. I. This is a cast aluminum base, which is bolted onto the engine in place of the bottom plate. It has a connection to the flywheel sump and an indicator which shows the quantity of oil. It holds eight quarts of oil, can be attached, it is stated, in one hour, and sells for \$12.

A vacuum oil feed designed to answer the same purpose is made by the National Mfg. Co., Kalamazoo, Mich. It is mounted beside the carbureter and has leads to the flywheel circulation. No attention is required except to fill the oiler. No machine work is necessary. Price, complete with tubing and connections, \$7.50.

A pump-feed system with a sight oil feed is made by the Pedersen Lubricator Co., New York. The Pedersen Ford oiling system has a small rotary oil pump, easily attached to the end of the timer shaft; this pump draws the oil from a one-gallon tank and forces it through an indicator on the dash, which is provided with a feed regulator. The tank is said to give 200 to 300 miles to one filling. Price \$15.

Owing to the number of cars in service, refiners have found it possible to produce an oil particularly adapted to Ford engines at a price somewhat less than that asked for the various grades needed by other cars. One such concern is the Fiske Bros. Refining Co., New York. The Ford motor oil produced by this company is believed by it to have just the



NATIONAL VACUUM OIL FEED FOR FORDS, MOUNTED BESIDE CARBURETER

right body, fire test and other qualities to insure greatest efficiency in the Ford motor. It sells at 30 cents per gallon in 50-gallon lots. Another is the Marshall Oil Co., Inc., Marshalltown, Ia., whose Ford special oil is made expressly for the Ford motor. This sells at 35 cents in a 30-gallon steel faucet drum.

The Auto Parts Co. has a combination breather and oil filler of cast aluminum to be fastened to the Ford breather. It has a screen of wire and permits filling the crank case without spilling the oil. It costs \$1.50.

The Invader Oil Co., New York, is just placing on the market an oil specially designed for use on Ford cars. It is to be known as Fordoil and will be sold at a low price and in 5-gallon cans only. It is to be made from Pennsylvania crude, highly filtered.

The Vacuum Oil Co., New York, has produced its Mobilubricant in a new handy package, particularly designed for the Ford. The package

consists of a can holding a smooth, light-colored medium body grease carefully strained. It is equipped with a spout which screws on in place of the usual cap and has a small key by which the grease is expelled. It is designed to take the place of a grease gun and the spout is intended to fit the filler plug opening in the differential of Ford cars. Incidentally it fits the filler plug of many other makes. It is in two sizes, the 1-pound size selling at 25 cents and the 3-pound at 65 cents.

For the Ford engine the Vacuum Oil Co. produces Gargoyle Mobiloil, grade E. This has a light body and flows freely in cold weather. One-gallon cans are 80 cents and 5-gallon cans, 65 cents a gallon.

The New York & New Jersey Lubricant Co., New York, manufacturer of the Non-fluid oils, is marketing a lubricant gun called the Kejex, which is intended for Ford owners. The can was designed to simplify the work of filling cups and other parts that ordinarily can just be reached by a lubricant gun. Kejex is a gun in itself and is delivered ready filled with K-000 Non-Fluid oil. A key and spout are supplied with each can, and the grease is ejected when the key is turned. Packages of this sort are very handy and make an easy method of handling the grease, greatly appreciated by the consumer.

Another auxiliary lubricator is the Martens lubricator. This not only provides a pump-operated circulating system, but an extra oil reservoir as well. The pump is driven from the camshaft and oil is sent through a sight feed on the dash. The system is manufactured by the E. A. Martens Co., Lafayette, Ind., and marketed by the Automobile Supply Co., Chicago, distributors. It sells ready for quick installation at \$15.

Windshield Ventilators and Attachments

LATER models of Fords with their fore doors have a tendency to become uncomfortably warm in summer. To overcome this, special windshield ventilators have been brought out to admit fresh air under the windshield. One of these is made by the Security Co., of Pittsburgh, Pa. It consists of two slotted brackets to be attached to the inner side of the dash and a felt strip to go on top of the dash, permitting the bottom of the windshield to be moved inward several inches at will and thus allow fresh air to enter the driver's compartment. It sells for \$1.

A similar device, but one which has a multitude of functions, is the Dad combination windshield ventilator, robe rail and handy tool. The whole apparatus may be used as a ventilator in summer or a robe rail in winter. Within it is a rod having a slotted end, which can be used for turning petcocks to drain the

radiator, crank case and fuel tank without getting under the car or soiling the hands. Also it may be used as a gasoline gauge. This variously useful instrument costs \$5 from the Dean Auto Devices Co., Chicago.

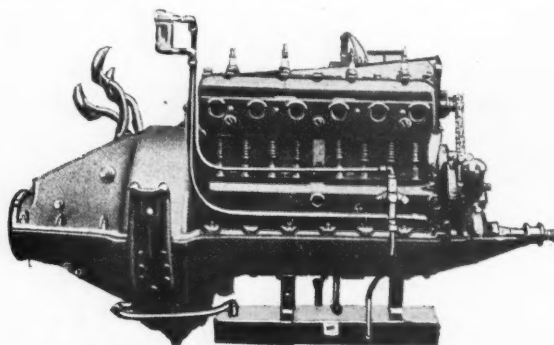
A rain-vision windshield attachment designed for Ford cars but which can be used on others as well, has been recently brought out by the Banker Windshield Co., Pittsburgh, Pa. This attachment is designed to provide a means for adjusting the top fold of the shield to permit the driver to see under the glass instead of through it and still protect him from the weather at all times. It also provides a means of ventilating the car. The attachment replaces the hinges on the regular shields and is so arranged so that it can be installed by the owners with little trouble. It lists at \$5.00.

The Auto Parts Co., Chicago, offers a windshield ventilator which permits the lower por-

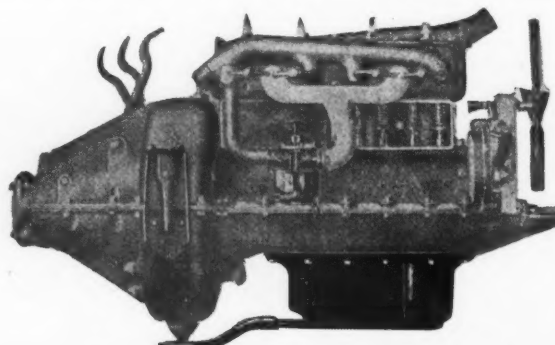
tion of the windshield to be carried inward several inches to give a circulation of cool air. The outfit sells at \$1.80.

Though not a windshield ventilator, an arrangement which serves a similar purpose—to keep the passengers cool—is the hot-air shield made by the Home Light Co., Chicago. This is a sheet metal shield, which fastens under the footboard over the pedals to prevent the hot air from the engine coming up through the pedal slots. It does not interfere with taking out the footboards. It is listed at 50 cents. Windshield ventilators are sold at \$1.25 by the L. P. Halliday Co., Streator, Ill.

For those who desire to carry their robe rails on the back of the front seat the Emil Grossman Co., New York, has produced a special robe rail of the folding type designed to fit the Ford car. The fittings are ground malle-



MARTENS LUBRICATOR FOR FORDS



DANVER AUTOMATIC AUXILIARY OILER

able iron and the bar is a steel tube covered with brass shell, highly polished. It is 31 1/4 inches long and weighs 1 1/2 pounds. It sells at

from \$0.80 to \$1.10, depending on the finish.

A special outfit for the Jiffy quick-acting side curtains are made by the Jiffy Curtain Mfg.

Co., Detroit, Mich. The Hercules Rubber Co., New York, lists them at \$12.50 for the roadster and \$15 for the touring cars.

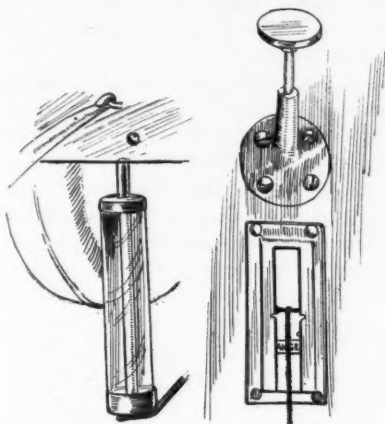
Gasoline and Oil Gauges Designed for Ford Installation

To enable owners of Fords to determine the amount of oil in the engine base a number of different devices have been developed by the specialty makers. A number of the oil gauges brought out for Ford cars have the indicating mechanism on the dash and the float arrangement attached to the bottom of the crankcase, the two being linked by suitable piping. The majority of the gauges are

attached easily by the owner with such tools as a wrench and pliers.

Gasoline Gauges

The usefulness of a gauge which will indicate the amount of fuel in the gasoline tank needs no dilation here and accessory makers have taken advantage of the wide use of Fords to bring out special gauges for this car.



HENKLEMAN DASH OIL LEVEL INDICATOR

Most of the oil gauges for Fords are those which take the place of the lower petcock in the crankcase. These consist of a glass case into which the oil flows to the same level as in the case. The Emil Grossman Mfg. Co. is marketing one of the latter type at 60 cents. Two more concerns are the R. C. Hull Electric Co., Cleveland, O., and the Auto Parts Co., Providence, R. I., who also offer such types, the former at \$1 and the second named one at 50 cents. Two makers of dash gauges are the C. E. Henkelman Co., Atlantic City, N. J., and C. E. Bridges, Chicago, the former selling at \$3.50 and the latter at \$1.50. Similar ones are made by the R. W. Meyer Mfg. Co., Providence, R. I.

Another of the crankcase type is marketed by the American Auto Supply Co. This consists of a glass tube mounted in a metal shell cut out on both sides and white enameled inside so that the oil may be seen easily. It takes the place of the petcock, which may then be screwed in the base of the gauge to permit draining the crankcase. Thirty-five cents is asked for the outfit. A similar one is made by E. Edlemann & Co., Chicago, selling at 40 cents. L. P. Halladay, Streator, Ill., makes an oil gauge in white nickel-plate at 75 cents.

A dash oil gauge, known as the Cochran, is manufactured by the Cochran Pipe Wrench Mfg. Co., Chicago, to sell at \$1.50. It is a simple affair, consisting of a gas pipe connection from the sump under the flywheel to a float chamber beside the flywheel and thence up to a vertical dial on the dash. A float is connected to a pointer and is actuated by the oil level. A similar one is made by C. E. Bridges, Chicago.

The Culmer Engineering Co., New York, has a dashboard oil gauge which shows at a glance from the seat, just how much oil there is in the crankcase of the motor. In principle, it is a well in which there is an indicator on a cork float, working in a heavy glass tube on the dash. It can be installed in a few minutes and lists at \$2.

A crankcase oil gauge is marketed by the Auto Parts Co., Chicago, at 30 cents.

Filler cap gasoline gauges seem to be the leading type. These gauges replace the filler cap and show at all times the quantity of fuel in the tank. The Auto Parts Co., Providence,

R. I., is offering one of these at \$2.50, and Oliver C. Ritz-Woller, Chicago, is manufacturing such a gauge which sells for \$2.

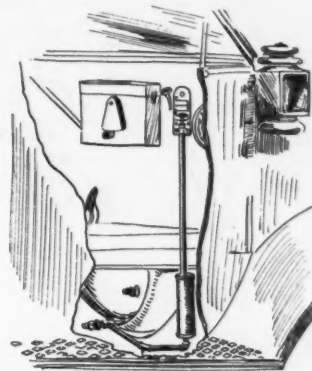
The Modern Specialty Co., Racine, Wis., makes a gauge under the Tanner patents which replaces the present filler cap on the tank so that no installation is necessary. It is of the dial type, with a pointer and reading "Empty," "1/4," "1/2," "3/4" and "Full." It sells for \$2.50. The Weiss gauge of this type is marketed by J. H. Hutton, Springfield, Mass.

A gasoline gauge arranged to be fitted to the dash, where it is constantly under the eye of the driver, is marketed by the Auto Parts Co. at \$5. Installation is very simple, it being necessary simply to unscrew the petcock from the bottom of the tank thread on a special fitting in its place and connect a pipe from this to the gauge on the dash. All fittings are furnished at the price. The Approved Auto Specialties Co., New York, also has a dash gauge at \$5. The Browne Supply Co., Toledo, O., markets a gauge at 15 cents.

A dash gauge called the Junior Gasometer is made for Fords by the Ritz-Woller Co. It is listed at \$5.

Ford License Brackets

Special license number plate holders for Fords are supplied by several concerns. Among these are the all-steel made by the Walker-Moore Co. The front bracket is formed in one piece and hangs from the front lamp fork; the rear is fastened to the lamp holder with the same set screw that holds the lamp and its lower edge is shaped to fit the lamp holder. These are 75 cents each. Security license holders made by the Security Co., Pittsburgh, Pa., can be applied to either the front or rear of the car. They are adjustable for all size plates. The special rear plate holder consists of a separate bracket for each end of the



COCHRAN DASH OIL GAUGE

plate, which clamps around the rear axle. The front plate clamps around the front of the headlight. These are 75 cents each. A model of the Neverout line of license brackets made by the Rose Mfg. Co., Philadelphia, Pa., is for Ford use alone. This is arranged to hold the tail lamp and license number in such a way that it will comply with the law of any state. L. P. Halladay, Streator, Ill., has a combination lamp brace and number carrier at \$1.25.

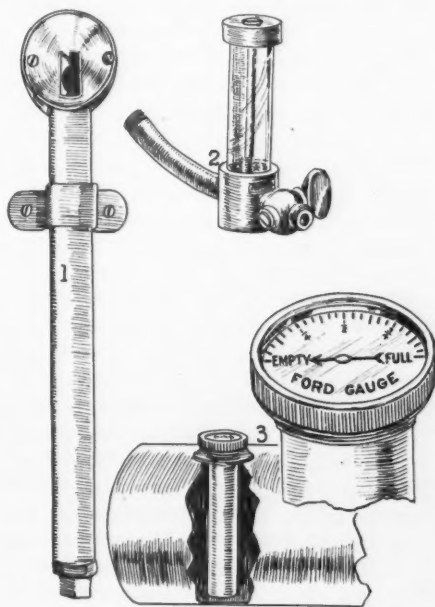
A special speedometer for Ford cars has been produced by the Stewart-Warner Speedometer Corp., Chicago. This is of the magnetic type, has a 60-mile rotating speed dial, a 100-mile trip register, and 1000-mile season register. The trip register can be reset rapidly to any tenth of a mile without disturbing the record of the season register. It sells for \$12.

Bosch Ford Price Reduced

Recent reduction in the price of the Bosch Ford magneto equipment described in Motor Age issue of May 7 resulted in an error in connection with this description. The price was given as \$70, but is now only \$58.

Connecticut Ford Price Reduced

Recent reduction in the price of the Connecticut shock absorber for Ford cars has brought these down to \$15 per set instead of the \$22.50 mentioned in connection with the description of these shock absorbers in Motor Age issue of May 14. These shock absorbers are not of the friction type as intimated in that reference.



TYPES OF FORD GAUGES

1, Junior Gasometer; 2, Auto Parts case oil gauge; 3, Tanner fuel tank gauge



BANKER WINDSHIELD VENTILATOR

The Accessory Corner

Day Tire Valve

A TIRE valve which takes the place of the ordinary valve supplied with the tire, and which is said to make tire pumping easy, is less liable to leak, and which has no spring is announced by the Atlas Auto Supply Co., Chicago. This new valve, known as the Day, is illustrated in Fig. 2, where the conical plunger is shown when the tire is deflated and inflated. The few working parts, the absence of springs and the ease with which a tire may be inflated by its use, are the prime features of the Day valve. It is sold in sets of five at 50 cents per set.

Legalite Reflector

The Legalight reflector is of the parabolic type and is to be placed inside the ordinary electric headlight for the purpose of obviating the glaring rays. This reflector is similar in shape to the big one. It is tilted downward at such an angle that although it casts its rays forward, the upper edge of the light never raises above a line parallel with the ground, thus avoiding all glare, while the lower edge strikes the ground very close to the car.

This reflector shown in Fig. 3 is built with a bracket at its back, set eccentric to the reflector, and so designed that a bracket or ferrule slips over the Edison socket ordinarily used. When the smaller reflector is in place the bulb is latched into its bayonet joint, and the socket is



FIG. 1—COLUMBUS TRAFFIC SIGNAL

The two arms one at either side of the car are raised and lowered by foot pedals; and thus take the place of a man's arm in warning the driver behind that a right or left turn will be made. The arms are red and are illuminated at night

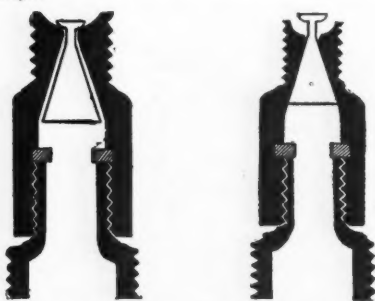


FIG. 2—DAY TIRE VALVE CONSTRUCTION

The left cross-section view of valve shows position of plunger when tire is deflated. The right cross-section view shows position of plunger when tire is inflated

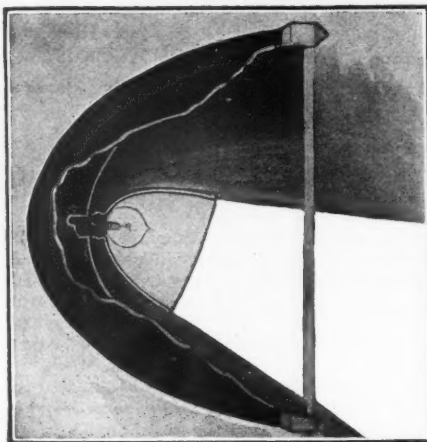


FIG. 3—LEGALITE REFLECTOR

This reflector is of the parabolic type and is placed inside the regular reflector as shown above, for the purpose of eliminating glare

then slipped backward by the ordinary focusing device and locked in such position that the small reflector's bracket or ferrule is held between the lamp and the big reflector. This holds it permanently in place, preventing any turning, slipping or joggling, it is claimed. It is made by the Legalight Mfg. Co., New York, and is retailed at \$2.50 per pair.

Stickalite Trouble Lamp

The Premier Electric Co., Chicago, has brought out a new trouble lamp known as the Stickalite, which consists of a 6-volt, 6-candlepower lamp mounted in a metallic tube fitted with an electromagnet. The electromagnet is used to make the lamp hold to any iron or steel part of the car and is so constructed as to permit the lamp to be placed at any angle, it is claimed. The Stickalite weighs 3 ounces and is 3 inches long and 1 inch in diameter. It is furnished with 10 feet of flexible cable and connector plug for attachment to any of the light sockets. It sells for \$1.

Wiard Automatic Speedler

The Wiard Automatic Air Valve Co., Detroit, is marketing a device called the Wiard Automatic Speedler, which feeds additional air to the carburetor and is said to effect a saving in fuel of 25 to 40 per cent. The speedler is operated and controlled by the heat of the motor through the action of a thermostatic blade, which is part of the device. The speedler is attached to the intake manifold of the motor so that the air is admitted at right angles to the flow of the mixture. The radiation of heat from the motor, only two degrees of which are necessary to warp the blade, opens a mushroom valve. The spray of air which is admitted through the device breaks up the large globules of gasoline on their travel from

the carburetor to the combustion chamber. The air that is admitted by this process is thus made the mixing agent as well as the active element in the mixture.

Thief-proof Ignition Lock

Securing a motor car against theft and joy-riding by making the ignition system inoperative, is the feature of the device, called the Thief-proof combination ignition lock, brought out by the Automobile Combination Lock Co., St. Louis. This lock appears very much like the control mechanism of a safe, having a circular scale and a rotating control button. The Thiefproof, shown in Fig. 4 opens both battery and magneto circuits and only when the proper three-number combination is made, will the ignition system come into operation. The one combination controls both battery and magneto and hence there is little left for the joy-rider, but to take a few hours' time obtaining new cables and rewiring the motor. The price is \$5.

Night and Day Goggles

In order to prevent the glare of the headlights of an oncoming car blinding the driver, T. A. Willson & Co., Reading, Pa., have brought out the Night and Day goggles which have amber lenses of double densities. The lower portions of the lenses are of light amber for use during the day and the upper portions of darker amber color for use at night. When the driver of a vehicle is confronted by dazzling headlights he simply tips his head so as to bring the vision through the darker segments and thus the glare is reduced sufficiently to make the road and the other car clearly visible. An additional feature of these goggles is that they cling closely to the face and so cause the space between the face and the goggles to be taken up. In this way dust cannot reach

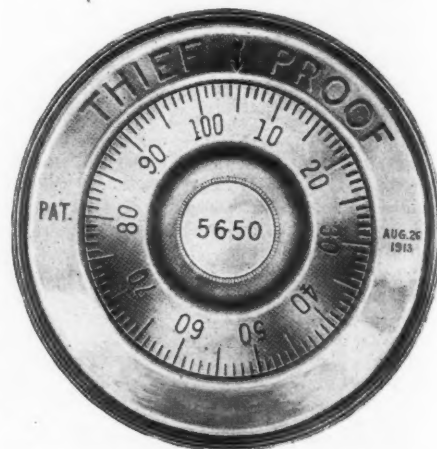


FIG. 4—THIEFPROOF IGNITION LOCK

A device for securing a motor car against theft by making the ignition system inoperative. It operates like the combination of a safe



FIG. 5—BRYANT TIRE TOOL

This tool will fit any style and size of rim and gives a long leverage so that removal is easy. The work is done from the outside with no interference

the eyes, it is claimed. The Night and Day goggles, showing the two-segment lenses are illustrated in Fig. 7.

Bryant Tire Tool

A tire tool which will fit all styles and sizes of rims is being marketed by Stevens & Co., New York. This tool, called the Bryant, makes easy work of tire removing, it is claimed, due to the long leverage obtainable and by doing the work from the outside of the wheel, loosens the inner bead easily and quickly. This tool shown in Fig. 5 may be used to remove and replace rings as well as tires. In the illustration the tool is being used to force the inner bead away from the clinch of the rim, the work being done from the outside. The price of the Bryant is \$2.

Columbus Traffic Signal

Ordinances in many cities which require the driver of a vehicle to extend his arm when he wishes to make a turn, have resulted in the announcement of the Columbus traffic signal. This signal, made by the E. S. Adams Co., Columbus, O., consists of two arms, one on each side of the windshield, these arms being raised or lowered by foot pedals and perform the functions of a man's arm in warning the driver behind. The Columbus, shown in Fig. 1, has a bright red disk at its

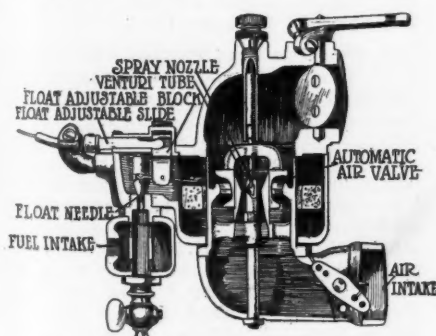


FIG. 6—METER-VALVE CARBURETER

This is said to feed gasoline and air in the proper proportions at all speeds. The float is controllable from the dash of the car

end which, when used at night, is illuminated by a 6-volt lamp. The signal is raised and locked by one operation and is released by slightly touching a catch. When used at night the signal is illuminated the moment it begins to raise. It sells for \$15 and may be installed in 1 hour, it is claimed.

Schum Nut Lock

A new type of nut lock has been announced by Schum Bros., New York; this lock depending upon the turn of a set screw in the head of the bolt for operation. The parts of the Schum are shown in Fig. 8 where it will be noted the set screw in the bolt controls the small lock N which fits in a recess. The lock N is backed by a spring S. The set screw moves the threads of the lock in or out of alignment thus locking and unlocking the nut and each time producing a slight click. The spring tension is relieved when the nut is locked and the set screw removed.

Dann Insert in Boxes

The Dann oil cushion spring insert is now being sold in lengths to fit particular makes of cars. Thus, an owner of a Buick can go into a supply store and get a set for a Buick car, and have the insert applied



FIG. 7—NIGHT AND DAY GOGGLES

The upper portions of the lenses are made of dense amber-colored glass and the lower of a lighter shade, the former being used for night driving so that the driver can see a car with glaring headlights and the latter is used for ordinary work

by any garageman. This material consists of a thin piece of metal with many holes, these holding a special lubricant which continually oils the spring leaves.

Auster Extending Tonneau Windshield

Charles H. Fryer Co., Providence, R. I., is marketing a tonneau windshield which is of the folding type and is called the Auster. The feature of this shield is that it can be folded out of the way and when required for use may be turned to position by the turn of a thumb screw. The shield is a three-part one and offers a neat and effective means of protecting the passengers in the tonneau, it is claimed. The shield, when folded up, rests against the back of the front seat and in no way interferes with the entrance or exit of passengers.

Cutler-Hammer Switches

The Milwaukee, Wis., concern of Cutler-Hammer announces a line of switches for motor car lighting service, which can be provided in single units, in gangs as they

are called, for the control of double-bulb headlights, in series-parallel for the control of headlights by switching the lamps in parallel and series and in combination form for controlling different combinations of lamps. The single unit is operated by one push and pull button affording quick make and break, it is claimed. The series-parallel switch affords a means of burning the bulbs in series or parallel in the former case reduced candlepower resulting for use in the city and in the latter the ordinary candlepower for country driving.

Meter Valve Carburetor

From Dayton, O., comes the announcement by the Meter Valve Carburetor Co. of a carburetor which is designed to feed air and fuel in the proper proportions at all motor speeds; by the use of a special valve known as a meter valve. As the name indicates it measures the mixture constituents. Another feature claimed for this instrument is economy, which is obtained by manually controlling the float, so that a rich or lean mixture may be obtained by simply moving a handle on the dash. In this way, it is claimed, the various conditions are met and the carburetor consumes the least amount of fuel for a given amount of work.

The carburetor, shown in Fig 6 has a single air intake, at the bottom, while the throttle control is at the top, the entire instrument forming a U turned sidewise. The spray nozzle is inside a venturi tube, as shown. The fuel needle is not rigidly attached but floats in a guide in the middle of the instrument; and is adjustable by a thumb screw at the top. When the throttle is closed and the vacuum thus reduced the automatic air valve and fuel needle will return by gravity to the closed position in order to obtain very slow or idling speed.

Meter Valve carburetors sell for from \$18 for the 1-inch to \$40 for the 2-inch. Hot air attachments may be had for from \$1 to \$2.

Four Sees Carbon Remover

A liquid carbon remover, known as Four Sees, is announced by the Carbon Cleaning Compound Co., St. Louis, Mo. A measured amount of the liquid is poured into each cylinder of the motor, through a spark plug opening and permitted to remain there for 15 minutes. After this the motor is started and operated for a short time to permit any loosened carbon to blow out. Four Sees sells for \$1.50 per can, which contains sufficient liquid for more than 12 operations.

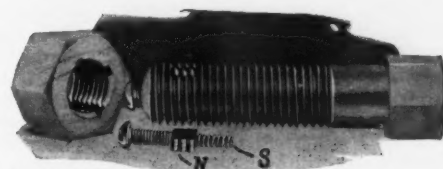


FIG. 8—SCHUM LOCK NUT

The set screw shown does the work of locking the nut in position, and it does it by moving the threads of the lock N out of alignment with the other threads



From the Four Winds



COLORADO to Waive Fees—Announcement is made by the Colorado Good Roads Association bulletin that all tourists who spend 3 months or less in Colorado this summer will not be required to pay license tax. In the past years, tourists to Colorado have been required to pay a license tax in every town in which they tarried longer than 3 days.

Registration Records Shattered—Wisconsin motor registrations by private owners for the year 1914 topped the record made through the full year of 1913 on May 5, on which day license No. 34,647 was issued. The 1913 total for Wisconsin was 34,646. This is the earliest date that registrations have exceeded the previous year's figures. On May 9 the total 1914 registration passed 35,250 and applications are coming in at the rate of 75 to 85 per day.

To Mark Starved Rock Trail—The Business Men's Association of Ottawa, Ill., has inaugurated a movement to mark the Starved Rock trail between Chicago and Starved Rock park. Intermediate cities have been asked to co-operate. The trail will be marked by painting the poles with a white band and yellow rim with the stenciled words, "Starved Rock Trail." The route favored is via Delwood, York Center, Wheaton Golf Club, Naperville, Aurora, Montgomery, Bristol, Plano, Sandwich, Somonauk, Wedron, Sulphur Lick Springs and Ottawa.

86,156 Ohio Cars Registered—The Ohio state motor car department up to May 6 had issued 86,156 licenses since the time the new law became effective, March 1. This is the record for the entire year in 1913. State Registrar Shearer estimates that 114,000 licenses will be issued during 1914, which will give one car to every forty inhabitants in the Buckeye state.

Will Rebuild 1,000 Miles of Road—The Ohio Good Roads Federation has outlined its program for 1914, which calls for the rebuilding of at least 1,000 miles of the highways of the Buckeye state. The federation is actively co-operating with the Ohio state highway department with good results. The federation is backing the work of the commission named to codify the road laws of the state and bring order out of chaos. The federation believes that the compulsory drag law will do much to improve the dirt roads of the state. Another point in the plans of the organization is to secure an appropriation of \$25,000,000 from the federal government, of which Ohio will probably receive \$1,300,000.

Texas Post Road Assured—With the authorization of road bond issues by Travis, Hays, Comal and Bexar counties, the construction of the proposed government post road in Texas from Austin to San Antonio has been assured. The total cost of the road has been estimated at \$240,000 by government road engineers. Of this amount \$80,000 will be furnished by the federal government and the remaining \$160,000 apportioned among the counties through which the highway passes. This will be the first road constructed in Texas under the new federal law which permits the postmaster general to appropriate money to assist states in road work. It will be built under the supervision of government road engineers and will serve as a model of road construction for the entire state. The road has already been surveyed, mapped and logged, so that the engineers will be able to proceed with the

actual construction work at once. Governor O. B. Colquitt has notified Postmaster General Albert S. Burleson of the raising of funds by the counties along the route and certificates of deposit of the bond issues will soon be sent to Washington.

St. Louis Club Elects Officers—The smallest vote ever recorded—forty-three members casting their ballots—at an election of the Automobile Club, of St. Louis, resulted in the following selections to fill official chairs during the coming fiscal year: President, Edward M. Flesh; vice-president, George J. Tansey; secretary, Mathew F. Morse; treasurer, Samuel Plant. The following members will comprise the board of directors: Sam S. Pingree, Frederick H. Semple, E. J. Krause,

J. Boyle Price, John Brunner and Claude S. Kennerly. The fiscal year just closed, April 27, was the most successful in the club's history since it was organized in 1902. The membership roll on April 27 last year was 831; this year it had 2,150 names.

Welding Outfit for 500-Mile Race—The Northern Welding Co., of Minneapolis, will send a portable Vulcan welding outfit to the Indianapolis speedway for use at the time of the 500-mile race May 30. Manager L. E. Jordan and his mechanic, Carl L. Williamson, will manage the operation of the machine. On the 1913 annual reliability run of the American Automobile Association from Minneapolis to Glacier Park, Mont., the Vulcan machine was utilized daily to repair broken springs, knuckles and other parts.

Motor Carnival at Atlantic City—What promises to be the largest run ever held in the east will be conducted by the Philadelphia Inquirer on May 29, from Philadelphia to Atlantic City, N. J. The week of May 25 to 30 will be carnival week in Atlantic City and the business men of both cities will co-operate in order to make the event a record-breaker. The run will be a sociability secret time affair, open to all classes of cars, gasoline and electric. Cash prizes as well as loving cups will be distributed to the winners.

Mutual Insurance Company Formed—A mutual insurance company that will confine its business to the insuring of motor cars exclusively has been organized at Oshkosh, Wis., under the name of Winnebago Limited Mutual Automobile Insurance Co. The organizers are leading citizens of Oshkosh. The company is without capital stock, but each policy holder is a member of the association. Motor vehicles will be insured against fire, theft, liability, burglary, etc. The liability of policy holders is limited to three times the amount of the annual premium paid by each for membership.

Want Smaller License Plates—The Elgin Motor Club has adopted resolutions which have been sent to all organizations of motorists in Illinois and which are believed to be worthy of the attention of the legislators. The resolutions read: "The license numbers required on Illinois motor cars are so large that they are objectionable. The law requiring the owner of a motor car to make a sworn affidavit each year as to ownership is a useless expense and an unnecessary inconvenience. It is the sense of the Elgin Motor Club that the size of the license plates for motor cars in Illinois be reduced one-half and that motor licenses be annually renewed on the filing of the original card, and that the annual affidavit now required be eliminated from the law."

Another Toll Road Passes—Another "relic of barbarism," the toll road, is rapidly passing in Wisconsin. At Fond du Lac, Wis., last week the old Taycheedah toll road, one of the first in Wisconsin, was put out of business in the suit brought by Fond du Lac people 6 years ago and now decided. The court held that the charter of the Sheboygan and Fond du Lac Road Co. expired February 6, 1914, and the successors of the ancient corporation are no longer entitled to collect money for the use of the highway. It is believed that not more than two or three toll roads now exist in Wisconsin. Two toll roads in Milwaukee county were abolished last year by the commencement of permanent road improvement under state aid.

Coming Motor Events

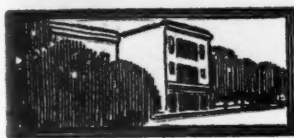
SHOWS AND CONVENTIONS

June 23-26—S. A. E. summer meeting, Cape May, N. J.
September 26-October 6—Berlin show.
October 17-24—Show, Pittsburgh, Pa.
October 16-26—Paris show.
November 6—Olympia show.
November 9-14—American Road Congress, Atlanta, Ga.

CONTESTS

May 25-26—Targa Florio race, Sicily.
*May 30—Indianapolis 500-mile race.
May 30—New York track meet.
May 30—Track meet, Providence, R. I.
June 1—Florio cup race, Island of Sicily.
June 1—Reliability, Philadelphia, Pa.
June 6-7—Track meet, St. Louis, Mo.
June 10-11—Isle of Man road races, Great Britain.
*June 18—Hill climb, Uniontown, Pa.
June 19—Track meet, Boston, Mass.
June 20—Interclub reliability, Philadelphia, Pa.
June 27-July 4—National touring week.
June 29-July 2—A. A. A. National Reliability tour.
June 30—Track meet, Sioux City, Ia.
July 3-4—Road races, Tacoma, Wash.
July 4—French grand prix, Lyons.
*July 3-4—Montamara Festo road races, Tacoma, Wash.
*July 4—Three hundred mile race, Sioux City, Ia., speedway.
July 4—Track meet, Providence, R. I.
July 4—Hill climb, Richfield Springs, N. Y.
July 17-18—Speedway races, Seattle, Wash.
July 18-19—Speedway races, Seattle, Wash.
July 30, Aug. 1 and 3—Beach meet, Galveston, Tex.
July 25-26—Belgium grand prix road races.
August 15—Le Mans cyclecar grand prix race.
July and August—French army truck subsidiary trials.
August 2-9—Six day cyclecar reliability in French Alps.
August 16—Coupe Internationale; light car race, Le Mans.
August 17—Grand Prix of France, Le Mans.
August 21-22—Road races, Elgin, Ill.
September 5—Track meet, Milwaukee, Wis.
September 6-7—Italian grand prix.
September 7—Track meet, Providence, R. I.
September 9—Speedway races, Pomona, Cal.
September 9—Road race, Corona Beach, Cal.
September 14—Track meet, Milwaukee, Wis.
September 18-19—Track meet, Hutchinson, Kans.
October—Gallien hill climb, Paris.
October 2-3—Track meet, Oklahoma City, Okla.
October 2-3—Track meet, Trenton, N. J.
October 9—Speedway race, Chicago.
November 8-11—Track meet, Shreveport, La.
November 15—Kerosene motor tests, Paris, France.
November—El Paso-Phoenix road race.

* Sanctioned by A. A. A.



Among the Makers and Dealers



TIRE Company to Leave Akron—The Quality Tire and Rubber Co. of Akron, O., has filed papers with the secretary of state changing its location from Akron to Hartsville.

City Official Tests Moon—The city inspector of weights and measures of St. Louis last week was put to a new task when the Moon Motor Car Co. applied for attestation or check of the mileage per gallon of gasoline produced by the new Moon lightweight six. The inspector found the car traveled 15½ miles on 1 gallon and delivered a certificate to that effect to the sales manager of the firm.

Invents New Spark Plug—Elmer R. Batchelder and John E. Gallant, who are employed in the repair shop of Edward F. Matthews, Ford dealer for Worcester, Mass., have just invented a noncircuit spark plug. It is known as the B-G Nevershot plug and an application has been made for a patent. The plug prevents misfiring caused by the coating of foreign substances on the porcelain insulator, such as carbon or oil deposit.

Tractor Company is Financed—The Killen-Strait Mfg. Co., Appleton, Wis., gas tractors and other power machinery, which is the reorganization of the Killen-Walsh Mfg. Co., has now been permanently financed and is ready to proceed with its plans for greatly extending the business and production, particularly of Strait tractors. A. W. Priest, an Appleton capitalist, has taken a heavy financial interest and assumed the duties of secretary and treasurer.

Minneapolis Has Cyclecar Plant—The Twin City cyclecar is the latest production of Minneapolis motor factories. It is manufactured by R. R. Griffith. The first car was built for C. H. Scholer for use in the Twin Cities. It was such a success that general construction has begun. The new cyclecar is equipped with wire wheels and has side-by-side seats and four-cylinder engine cast en bloc. The engine is air-cooled. Piston valves replace poppet valves. The valve mechanism runs in oil and has no springs, rollers, guides or tappets.

Seeks Substitute for Hickory—Professor W. K. Hatt, head of the mechanical department of Purdue university, Lafayette, Ind., has undertaken an extensive test of woods with a view to finding a substitute for hickory, which is becoming scarce. Wheels also are being tested to determine their strength. A steel ball 7/16 of an inch in diameter is pressed into the wood spoke through a hole in a metal plate whose thickness is one-half the diameter of the ball. The force required to imbed the ball through the hole in the metal plate into the wood is recorded. The force required varies from 200 to 3,000 pounds, according to the grade of the wood.

Electric Cars on Display—A quiet exhibit of electric pleasure vehicles, perfectly in keeping with the silent character of the electric itself, is being held in the new showroom of the New York Edison Co. at Fifteenth street and Irving place, New York. The building was recently completed and the showroom, which is so large as almost to be a hall, is an eminently satisfactory place for the purpose. The cars shown are a representative group, including an Ohio brougham, a Rauch & Lang town car and a five-passenger brougham, a Detroit runabout with top, a Baker brougham, a Waverley roadster of the gasoline type, which so strongly resembles a gas car that it looks

strangely out of place among the typical electrics, a Waverley brougham and a Ward coupe and chassis. The cars will remain on exhibition until May 30.

Birdsall With Gary Company—Edward T. Birdsall, M. E., of Detroit, has been appointed consulting engineer and purchasing agent for the Gary Automobile Mfg. Co. of Gary, Ind., which is building a six-cylinder touring car and also a six-cylinder speed car, using a motor of 3¼-inch bore and 5½-inch stroke.

To Make Motors at Beloit—The works of the defunct John Thompson & Sons Co. at Beloit, Wis., purchased from the trustee by E. M. Kenyon, manager of the Chicago branch of the Dodge Mfg. Co., Mishawaka, Ind., are to be turned into a large gasoline engine industry by Mr. Kenyon. Plans are immature, but it is intimated that part of the production will consist of motors for pleasure and commercial vehicles.

Discovers New Electroplating Solution—An important discovery of interest to the motor car industry has just been made by Professor Oliver P. Watts, director of the laboratory of applied electro-chemistry at the University of Wisconsin, Madison. It is in the nature of a certain black nickel solution which can be successfully used for electroplating aluminum. Up to this time experimentation along this line has met with indifferent success. The presence of arsenic in many solutions and the fact that the deposits were not durable, made the problem a difficult one. A long series of experiments

by Professor Watts has proven that a certain solution often used on copper but containing no harmful elements such as arsenic, which is often found in black nickel solutions, produced a firmly adhesive plating when applied to aluminum and can be used probably more successfully for plating aluminum than copper.

Armstrong-Johnson Co. Organizes—The Armstrong-Johnson Co., of Columbus, O., which was incorporated recently with a capital of \$10,000, is a partial reorganization of the Barndt-Johnson Co., of South Columbus, which went into the hands of a receiver a year ago. The company will make motor car tops, bodies and other supplies, and will locate a plant on the north side. W. R. Johnson was elected president; Minter Armstrong, vice-president, and James H. Johnson, secretary.

Dealers Must Obtain Licenses—The new license tags for motor car dealers in St. Louis reached License Commissioner Alt this week and he will start a vigorous campaign to see that all dealers get one. The dealers, most of them, Alt says, do not know they are required by law to take out such a license. Last year the city law conflicted with the state law on the license question and as a result the law was declared unconstitutional. The new ordinance recently enacted, however, requires every person who operates one of the cars of any dealer to have a license in his possession. The fee is \$10 for each license and for duplicates \$5. Thus far, but five dealers have taken out the tokens.

Recent Incorporations

Akron, O.—Pike Rubber Co., capital stock, \$50,000; to manufacture and deal in rubber goods; incorporators, O. C. Pike, F. Grether, F. Selzer, V. R. Hardy.

Biddeford, Me.—Long Ford Auto Co., capital stock, \$150,000; incorporators, J. H. Pierce, R. O. Brewster, D. W. Snow.

Boston, Mass.—Knox Motors Co., capital stock, \$2,500,000.

Boston, Mass.—Harriman Motor Co., capital stock, \$10,000; incorporators, H. B. Chessman, D. F. Collins, G. L. Ware.

Buffalo, N. Y.—Niagara Battery Corp., capital stock, \$5,000; to manufacture storage batteries; incorporators, G. H. Woodward, H. B. Parry, E. C. Schlenker.

Buffalo, N. Y.—Bigger Rubber Preservative Co., capital stock, \$10,000; incorporators, A. F. Bigger, W. J. Connors, W. F. Hocheins.

Cleveland, O.—Commercial Truck Co., capital stock, \$25,000; incorporators, L. M. Keyes, F. B. Fuels, G. W. House, C. R. Brown.

Cleveland, O.—Commercial Truck Co., capital stock, \$25,000; to deal in motor cars; incorporators, P. S. Crampton, F. B. Fuels, G. W. House, C. R. Brown and H. Davis.

Cleveland, O.—Euclid Penn Auto Supply Co., capital stock, \$20,000; to deal in motor car accessories; incorporators, E. T. Cravin, L. S. Buchanan, C. L. Smith, W. Farver, V. P. Hendrick.

Columbus, O.—Auto Combination Switch Co., capital stock, \$10,000; to deal in motor car accessories; incorporators, H. R. Elliott, C. E. Dennis, L. A. Van Anda, L. M. Van Anda, E. B. Dennis, E. Dennis.

Esopus, N. Y.—Simpson Garage, capital stock, \$1,600; to conduct garage; incorporators, H. Cohen, E. Adler, J. J. Miller.

Freeport, N. Y.—Forbes Rubber Co., capital stock, \$10,000; to manufacture tires, etc.; incorporators, Thomas Forbes, Jr., G. V. Sloat, A. S. Sloat.

Gloversville, N. Y.—Auto-Comfort Robe Co., capital stock, \$25,000; to manufacture motor car robes; incorporators, F. G. Mildreth, L. W. Rourke, U. C. Patterson.

Indianapolis, Ind.—Power Car Co., capital stock, \$15,000; incorporators, F. M. Fauvre and E. H. Darrach.

Louisville, Ky.—Sampson Engineering Co., capital stock, \$350,000; to manufacture starters;

incorporators, B. N. McGraw, D. A. Caldwell, N. H. Wright.

Minneapolis, Minn.—Spool-Valve Motor Corp., capital stock, \$50,000; to manufacture gasoline engines; incorporators, L. B. Bird, C. H. Lundgren, J. E. Tappan.

New York—Taxi Auto Livery, capital stock, \$1,000; incorporators, T. P. O'Hare, D. O'Hare, J. F. O'Hare.

New York—Ashley Wire Wheel & Rim Co., capital stock, \$50,000; to manufacture wire wheels; incorporators, R. W. Ashley, F. W. Kolb, C. Gaschott.

New York—Shirley Auto Fabric Co., capital stock, \$10,000; incorporators, E. J. Shirley, A. Shirley, M. Shirley.

New York—Thief Proof Auto Lock Co., capital stock, \$50,000; to manufacture electrical apparatus; incorporators, F. Waller, E. C. Hobcroft, M. J. Neumann.

New York—Knapp Motor Corp., capital stock, \$10,000; incorporators, H. L. Hughes, T. G. Jenkins, E. B. McKellar.

New York—Kelly-Springfield Tire Co., capital stock, \$450,000; to manufacture and deal in motor car accessories.

New York—Seventh Street Garage, capital stock, \$10,000; incorporators, S. Frankfater, M. Pollak, J. Klinger.

New York—G & J Tire & Rubber Co., capital stock, \$10,000; incorporators, J. W. Bebus, E. A. Jacobs, S. S. Levine.

New York—Portage Rubber Co., capital stock, \$1,000; to manufacture tires, etc.; incorporators, E. P. White, W. W. Wildman, J. F. Curtin.

Portland, Me.—Arco Rubber Co., capital stock, \$10,000; to manufacture tires, etc.; incorporators, L. D. Apsley, W. E. Tucker, D. W. Snow.

Saginaw, Mich.—Saginaw Motor Co., capital stock, \$150,000; to manufacture cyclecars; incorporators, A. R. Thomas, W. L. Wells.

Sapulpa, Okla.—Oil City Motor & Machine Co., capital stock, \$2,000; incorporators, C. W. Tolliver, R. V. Rule, C. W. Welsh.

Toledo, O.—Rupp-Skelton Motor Co., capital stock, \$50,000; to deal in all kinds of motors; incorporators, R. G. Young, J. Nye, J. Greenwald, B. Young, B. W. Johnson.

Tulsa, Okla.—Mid-co Petroleum Co., capital stock, \$25,000; incorporators, M. M. Travis, A. E. Aeronson, R. S. Fellova.

Warren, O.—Auto Test Co., capital stock, \$20,000; to deal in motor car supplies; incorporators, R. I. Spellman, H. E. Vaughan, H. G. Paden, F. W. Andrews, C. S. Vaughan.

White Plains, N. Y.—Ashley Wire Wheel & Rim Co., capital stock, \$50,000; incorporators, F. Oberkirch, R. W. Ashley, H. L. Stuart.

Wilmington, Del.—Champion Motor Car Co., capital stock, \$750,000; to manufacture motor cars; incorporators, H. E. Latter, W. J. Mahoney, O. J. Reichard.

Wilmington, Del.—Columbia Electric Vehicle Co., capital stock, \$10,000.



Brief Business Announcements



INDIANAPOLIS, Ind.—The Lyons-Atlas Co. has opened a downtown salesroom at 249 North Pennsylvania street.

St. Louis, Mo.—The Panama Equipment Co. has opened a shop here to equip motor cars with Punctureless Cushion, a substitute for air.

Washington, D. C.—A W. S. L. sales office has been established in Washington, D. C., in the Evans building, 1420 New York avenue, with W. G. Davis in charge.

Boston, Mass.—L. M. Cotton, manager of the General Automobile Co. for some time, has gone into business for himself. He has located at 922 Commonwealth avenue, where he will handle a line of motor supplies.

Portland, Ore.—Holmes, Lewis & Gaston will open up a garage and repair plant in Portland, Ore., in a large reinforced concrete building, which was formerly the home of the Portland Hunt Club. The firm will spend upwards of \$25,000 in new equipment.

Columbus, O.—The Blevin Auto Sales Co. of Toledo, O., has purchased from the Twyman Motor Car Co. of Columbus the West Virginia and Indiana agency for the Studebaker line. The Blevin Auto Sales Co. will make its headquarters in the Twyman store-room on North Fourth street.

Fond du Lac, Wis.—Robert Zinke, president of the Zinke Mercantile Co., Fond du Lac, Wis., has purchased the business and stock and garage of the Crescent Motor Co. of Fond du Lac, from W. C. Reinig, the chief stockholder. The deal includes the agencies

for the Chalmers, Studebaker, Overland and Saxon cars. Mr. Zinke will continue the business under the same name, but will not assume active management.

Milwaukee, Wis.—The Swinehart Tire Sales Co. of Milwaukee has been organized with R. M. Werner as president, and established a depot and offices at 139 Oneida street.

Cleveland, O.—The Alco Motor Co. of Cleveland has filed papers with the secretary of state changing its name to the Main Motor Co.

Louisville, Ky.—The Waverley Co. of Indianapolis, Ind., has established a local salesroom, 1206 East Broadway. K. A. Ridenour and S. G. Barr are in charge. The Waverley electric formerly was handled in this territory by A. E. Reid.

Milwaukee, Wis.—The Billings Auto and Tire Supply Co., 181 Fourth street, Milwaukee, Wis., which recently disposed of its accessory stock and announced that it would devote its future attention to tire sales, is now closing out its tire stock and the Billings brothers will join with their father, Fred C. Billings, in opening a retail piano store in the same location.

Green Bay, Wis.—H. F. Smith, former manager of the top and trimming department of the Kissel Motor Car Co. at Hartford, Wis., has joined with D. A. Graham of Fond du Lac, Wis., in the organization of the Northern Awning and Tent Co., which is now establishing a factory in Green Bay. Headquarters are in the Duchateau building

at 524-526 Main street, which is being equipped for the manufacture of motor car and boat tops and cushions, tents, awnings, etc. Mr. Graham formerly was head of an awning and tent company at Fond du Lac.

Montreal, Can.—The Englebert tire, manufactured in Belgium, is now represented in Montreal by H. W. Wheeler who has opened a salesroom at 319 St. James street.

Beloit, Wis.—The Lipman Air Appliance Co., Beloit, Wis., recently incorporated by Carl E. L. Lipman, president of the Lipman Mfg. Co., has taken quarters in the Lipman shops and is now producing a portable garage pump and a small pump to be attached to the motor. Several models have been in use in Beloit garages for some months.

St. Louis, Mo.—The Weber Implement and Automobile Co. of St. Louis last week bought the business and stock of the General Motor Co., local Hupmobile distributor, and took the 5-year lease the General company had on its building. The Weber concern, however, will continue in its old location. The Weber company will continue to handle the Lozier and Mitchell lines.

Kansas City, Mo.—The Samson Iron Works Co., of Fresno, Cal., manufacturing the 2-ton Samson farm and orchard tractor, has opened an eastern selling branch here. H. W. Montgomery is in charge and offices have been obtained with the Mid-West Sales Co., 1715 McGee street. The company plans an invasion of the eastern territory. The campaign will be directed from here.

Recent Agencies Appointed by Motor Car Manufacturers

PASSENGER CARS

Town	Agent	Make
Aukland, N. Z.	Aukland Auto Co.	Moon
Aurora, Ind.	C. O. Kemp & Son	Oakland
Baltimore, Md.	Menominee Garage	Ohio
Baltimore, Md.	Maryland Cyclecar Co.	Imp
Coeur d'Alene, Idaho	Walter G. Clark	Paige-Detroit
Chambersburg, Pa.	W. L. Forney	Maxwell
Chester, W. Va.	Finley Brothers Co.	Westcott
Casey, Ill.	W. C. Turner	Westcott
Cleveland, O.	Cuyahoga Motor Truck Co.	Westcott
Council Bluffs, Ia.	L. P. Madsen	Westcott
Dallastown, Pa.	Ammon R. Smith	Chevrolet
Flat River, Mo.	J. C. Parker	Oakland
Friendship, N. Y.	Middaugh & Thurston	Oakland
Georgetown, Tex.	Towns Brothers	Oakland
Griffin, Ga.	A. F. Gossett & Son	Oakland
Hillsboro, O.	R. D. Currie	Oakland
Louisville, Ky.	National Cyclecar Co.	Zip
Louisville Ky.	Thomas M. Carr	KisselKar
Louisville Ky.	Andrew Cowan & Co.	Grant
Lamartine, O.	Murdock & Kirby	Maxwell

Town	Agent	Make
Mattapan, Mass.	J. F. Duby	Ford
Minneapolis, Minn.	Alter Sales Co.	Alter
Mount, La.	Maxwell-Yerger Co.	Oakland
Norwalk, O.	Smith Bros.	Ford
New Bremen, O.	F. N. Allen & Son	Paige-Detroit
Quebec, Can.	Le Page Garage	Moon
Rio de Janeiro, Brazil	DuPonge Auto Co.	Moon
Racine, Wis.	Milton E. Laux	Lewis
Seattle, Wash.	W. P. Paugh	Oakland
Sheranville, O.	Elmer Vossler	Oakland
St. Louis, Mo.	Weber Implement Co.	Hupmobile
Soerabaya, Java	T. B. Intveld	Moon
Viola, Ill.	B. R. Mesbitt	Oakland
Viroqua, Wis.	Herman S. Hahson	Rayfield
Washington, D. C.	Cartercar Sales Co.	Cartercar
York, Pa.	Snyder Auto Co.	Maxwell
York, Pa.	G. E. Swartz	Saxon
York, Pa.	H. L. Bowers	Vulcan
York, Pa.	York Auto Exchange	Jeffery
York, Pa.	E. P. Beam	Republic

COMMERCIAL CARS

Brockport, N. Y.	Wells Hardware Co.	Menominee
Batavia, N. Y.	W. W. Buxton	Menominee
Bessemer, Mich.	Otto B. Olson	Menominee
Binghamton, N. Y.	F. H. Wilbur & Son	Stewart
Chicago, Ill.	Menominee Motor Sales Co.	Menominee
Cuyahoga Falls, Ohio	Henry Schultz & Sons	Menominee
Cleveland, Ohio	Colonial Sales & Service Co.	Menominee
Cambridge, Md.	Cambridge Auto Co.	Menominee
Detroit, Mich.	Siegel-Zeckendorf Co.	Stewart
Danville, Ill.	Robert Holmes & Bros.	Menominee
Erle, Pa.	Frank P. Fieger	Menominee
Emporium, Pa.	Emporium Machine Co.	Menominee
Fort Wayne, Ind.	B. S. Vail & Co.	Menominee
Hilton, N. Y.	L. I. Silliman	Menominee
Hartford, Conn.	Universal Auto Co.	Stewart
Indianapolis, Ind.	Fred P. O'Brien	Stewart
Kansas City, Mo.	A. E. Lewis	Stewart

Knoxville, Tenn.	S. Sedgwick & Sons	Stewart
Leetsdale, Pa.	F. G. Mohn	Menominee
Lawrence, Mass.	Knox Street Garage	Stewart
LaFayette, Ind.	G. S. Patterson	Menominee
Louisville, Ohio	Louisville Motor Car Co.	Menominee
Macon, Ga.	W. E. Cookerly	Stewart
Mansfield, Ohio	J. W. Newlon	Menominee
Milwaukee, Wis.	Imperial Auto Sales Co.	Stewart
New Tripoli, Pa.	Snyder & Winks	Stewart
Norway, Mich.	Norway Garage Co.	Menominee
Norwich, Conn.	Shea & Burke	Stewart
Peekskill, N. Y.	Sorenson Co.	Menominee
Omaha, Neb.	Lininger Implement Co.	Menominee
Olean, N. Y.	F. W. Forness, Jr.	Menominee
Portland, Me.	Portland Co.	Stewart
Philadelphia, Pa.	Service Motor Car Co.	Menominee
Sioux City, Ia.	John Kinkist	Stewart

HIGH *and* LOW TENSION MAGNETOS



MASTER VIBRATORS ROAD SMOOTHERS AUTO LOCKS

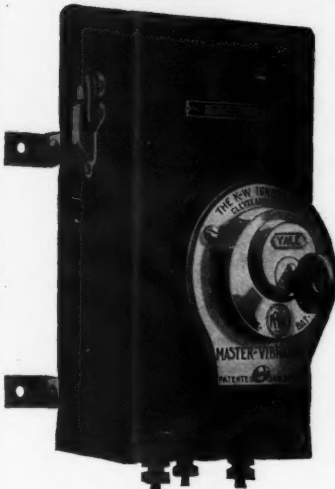
Right in Your Neighborhood



You will find a Ford Car Equipped with a

Master Vibrator

Ask the owner what it is doing for him every day



\$16 with K-W
Autolock Switch

You will find him enthusiastic about his K-W. He can tell you better than we of the economy, reliability and efficiency of the K-W Master Vibrator.

The K-W Master Vibrator contains a large, powerful condenser—proper capacity—and exceptionally large, solid platinum iridium contact points. A combination that insures a hot spark.

Over 90,000 Master Vibrator users have learned the value of this hot spark.

The K-W Master Vibrator gives:
Perfect Ignition—More Power—One adjustment instead of four—A hotter spark—Easier Starting—A smoother running engine—Less carbon deposits—Less gasoline used—Cleaner spark plug—No worry.

Don't Use Imitation Springs and Contact Points

K-W Master Vibrator owners are warned against the use of imitation springs and contact points on their Master Vibrators, as these positively will not work. For your protection all K-W points are put up in sealed envelopes, sealed with a label bearing our registered trade mark. Look for this K-W seal and the K-W Trade Mark that is stamped on the top of the "T" shaped bridge.

When replacing contacts use complete new springs. Do not solder new contacts to old springs, as solder destroys the contact and the spring itself will become bent and the cushion effect destroyed. The contact points on K-W Master Vibrators are large and are made of genuine platinum iridium, a material that costs three times as much as pure gold. Make sure you get the genuine with the K-W trade mark. Price \$3 per pair.

In buying your Master Vibrator be sure you get a K-W. Look for the K-W trade mark and the serial guarantee number. They protect you against imitations. If your dealer can't supply you we will send one direct, postpaid, on receipt of price.

Write for "That satisfied feeling Folder."



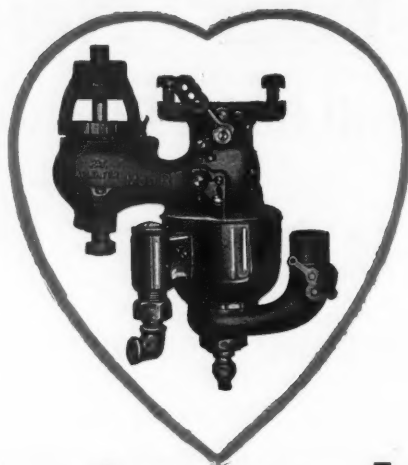
\$15 with Regular
Kick Switch

HEADLIGHTING OUTFITS

THE **K-W** IGNITION CO.
2835 CHESTER AVE. CLEVELAND, OHIO, U.S.A.

SPARK COILS SPARK PLUGS

1,500,000 SCHEBLER

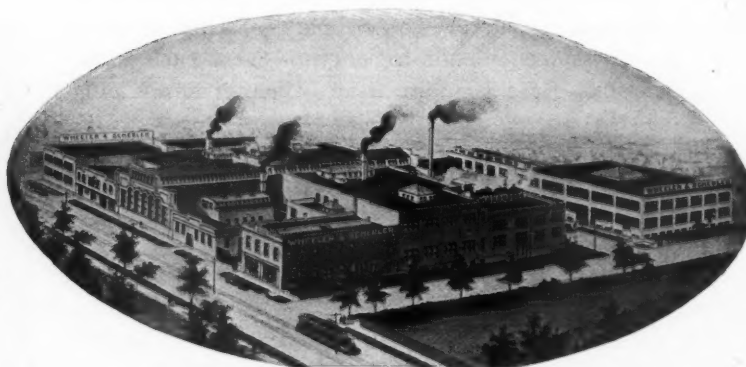


Carburetors In Use!

When a motor mechanic sees a Schebler on a motor he welcomes it as an old friend.

Do you want service and satisfaction? We give service—our instruments satisfaction.

The
Factory
Behind—



The
Schebler
Carburetor

Daily Capacity, 4000 Instruments

WHEELER & SCHEBLER, Indianapolis, Ind.

"Pioneers in Perfection of Carburetion"

BRANCHES:

Fry & McGill Motor Supply Co.
Automobile Accessories Co. Pittsburgh, Pa.
Ferris-Dunlap Auto Supply Co.
Interstate Electric Co. New Orleans, La.
Reinhard Bros. Co. Minneapolis, Minn.

Manufacturers' Supply Co.
Weinstock-Nichols Co. Los Angeles, Cal.
Pennsylvania Rubber & Sup. Co. Cleveland
Wheeler & Schebler. Chicago
Wheeler & Schebler. Detroit

Fred Campbell. St. Louis, Mo.
W. J. Connel. Boston, Mass.
Equipment Co. Kansas City, Mo.
Elyea-Austell Co. Atlanta, Ga.
J. C. Nichols. New York City
Weinstock-Nichols. San Francisco

Fairbanks, Morse & Co., Ltd., London, England
Canadian Fairbanks-Morse Co. (All principal Canadian cities)

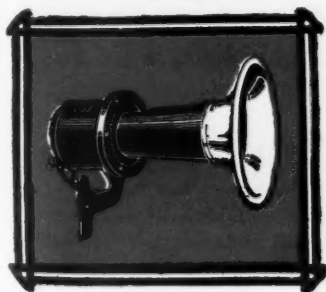
The KLAXON IDEA of Service

Mr. J. C. Stedman, Elkhorn, Kentucky, had an accident. His car was wrecked. His Klaxonet was smashed. He returned it to us and asked us how much it would cost to repair it.

This is from our letter to him:

"Although there is no possibility of the present condition of your instrument being due to faulty material or workmanship, still our broad Klaxon guarantee covers exactly a case of this kind. Your instrument will be put in perfect condition, any missing parts replaced, and it will be returned to you without charge.

We guarantee our instruments absolutely to give permanent satisfaction irrespective of the cause of their getting out of order."

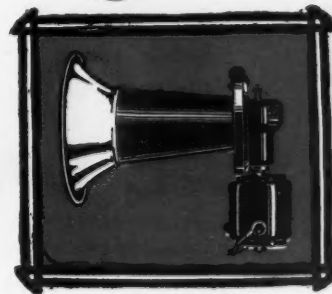


KLAXONET

Lovell-McConnell Mfg Company Newark, N.J., U.S.A.

KLAXON

"The Public Safety Signal"



KLAXON

This advertisement planned, written and set up entirely in the Klaxon Factory. Type composition by the Klaxon Press with "Klaxon" type especially designed by Goudy.

When Writing to Advertisers, Please Mention Motor Age.

Why Not Sell a Punctureless Tire?

You can not only do that, but sell one that will not blow out, requires no pumping, and is proof against all the tire trouble that detracts so much from the pleasure of motoring.

How can you do it? Just carry the

Dayton Airless Tire

Here is what the motoring world is sighing for—a trouble-proof tire that is comfortable! Scores of motorists in your territory want such a tire and don't know where to get it. Why don't you make money by selling them what they want to buy?

The DAYTON is neither solid nor pneumatic—it is of the distinctive DAYTON construction, which gives the advantages of both types and the disadvantages of neither. It rides as easy as a pneumatic and is as durable as a solid tire. The man with DAYTONS on his car is supremely indifferent to road troubles which strike terror to the heart of the average driver, for he knows there will be no tire trouble. A tire like this sells itself after it has once had a chance to prove its superiority.

There's great possibilities in this for the Dealer alive to his opportunities. Probably a score of Dealers in your town sell pneumatic tires—compete with one another for that business, but whatever make they sell, it WILL puncture, WILL blow out, WILL cause trouble.

Handle the DAYTON and you have no competition from similar tires, and can quickly prove its superiority to any pneumatics, no matter what make.

Go after it right and you can build up a tire business—profitable and ever increasing—that will be the envy and despair of your competitors.

Some territory is still open—yours may be included. Get busy now and start on the road to prosperity by saying—"Send me the DAYTON proposition."

THE DAYTON RUBBER MFG. CO.

1005 Kiser Street, Dayton, Ohio

1851 Broadway, New York

2123 Michigan Avenue, Chicago, Ill.



Don't Fall Down on the Vital Part of Your Car

At the present time practically all automobiles that are worth considering at all, are being equipped with Electric Lighting and Starting Systems.

The great majority of manufacturers of cars and electric systems will not consider the use of any but an **CLBA** Storage Battery in connection with them.

A few balk at the price of the **CLBA** Battery and substitute those which are cheaper.

The storage battery is the actual heart of the Electric System and for the work which it is called upon to do, the best is none too good.

Without a first class battery, the electric system is no better than junk.

With a battery, such as the **CLBA** has been proven to be, a battery that is full of life and buoyancy, vibrant with snap and energy, any electric system is sure to be successful.

You can't afford to overlook the little storage battery, and if the car you consider buying contains a cheaper, clap-trap battery, don't accept it unless the dealer agrees to give you an **CLBA** instead.



Willard Storage Battery Co., Cleveland, Ohio



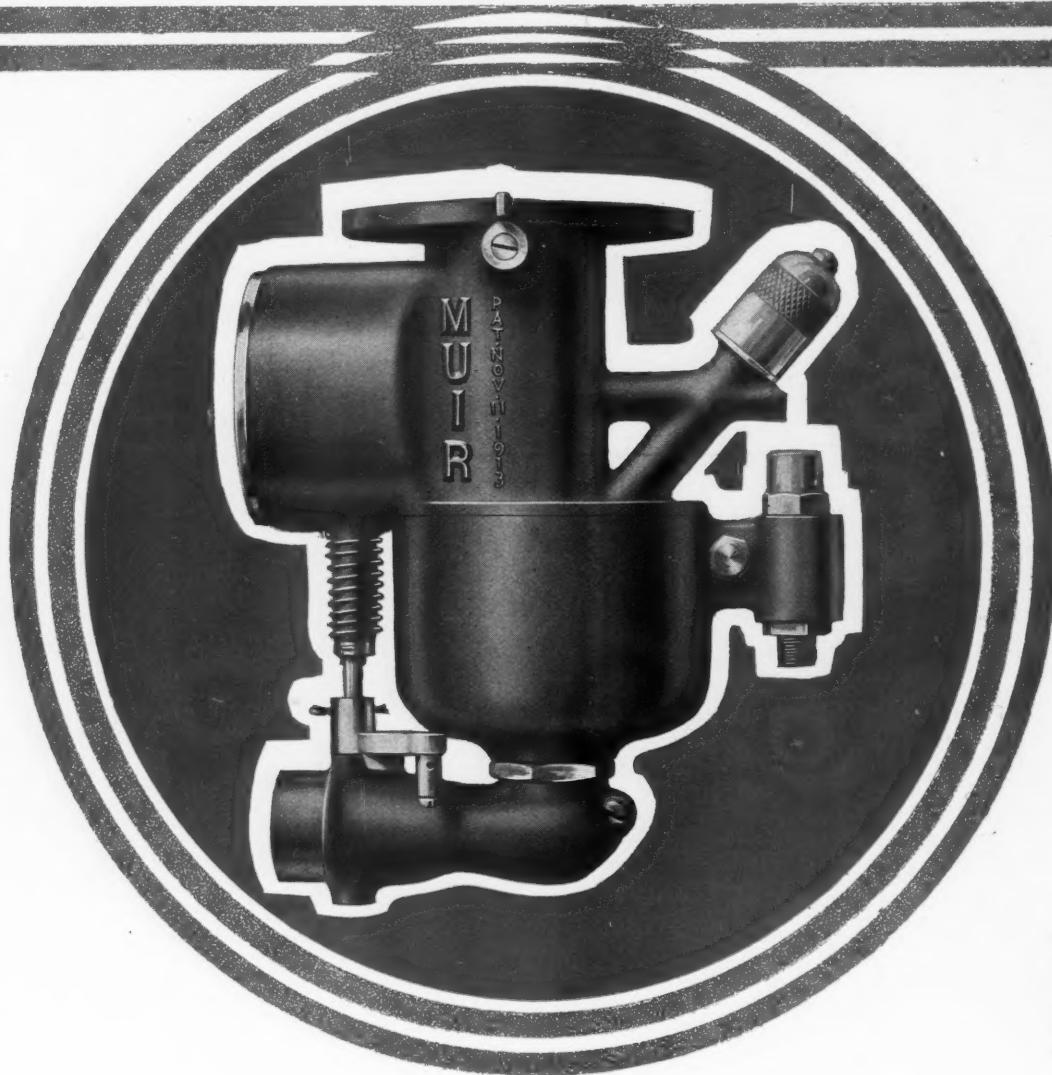
New York Branch: 136 W. 52nd St.
Chicago Branch: 2241 Michigan Ave.

Indianapolis Branch: 318 North Illinois Ave.

Detroit Branch: 736-740 Woodward Ave.
San Francisco Branch: 821 Monadnock Bldg.

SERVICE STATIONS IN ALL PRINCIPAL CITIES IN THE UNITED STATES, CANADA AND MEXICO

(101)



MUIR

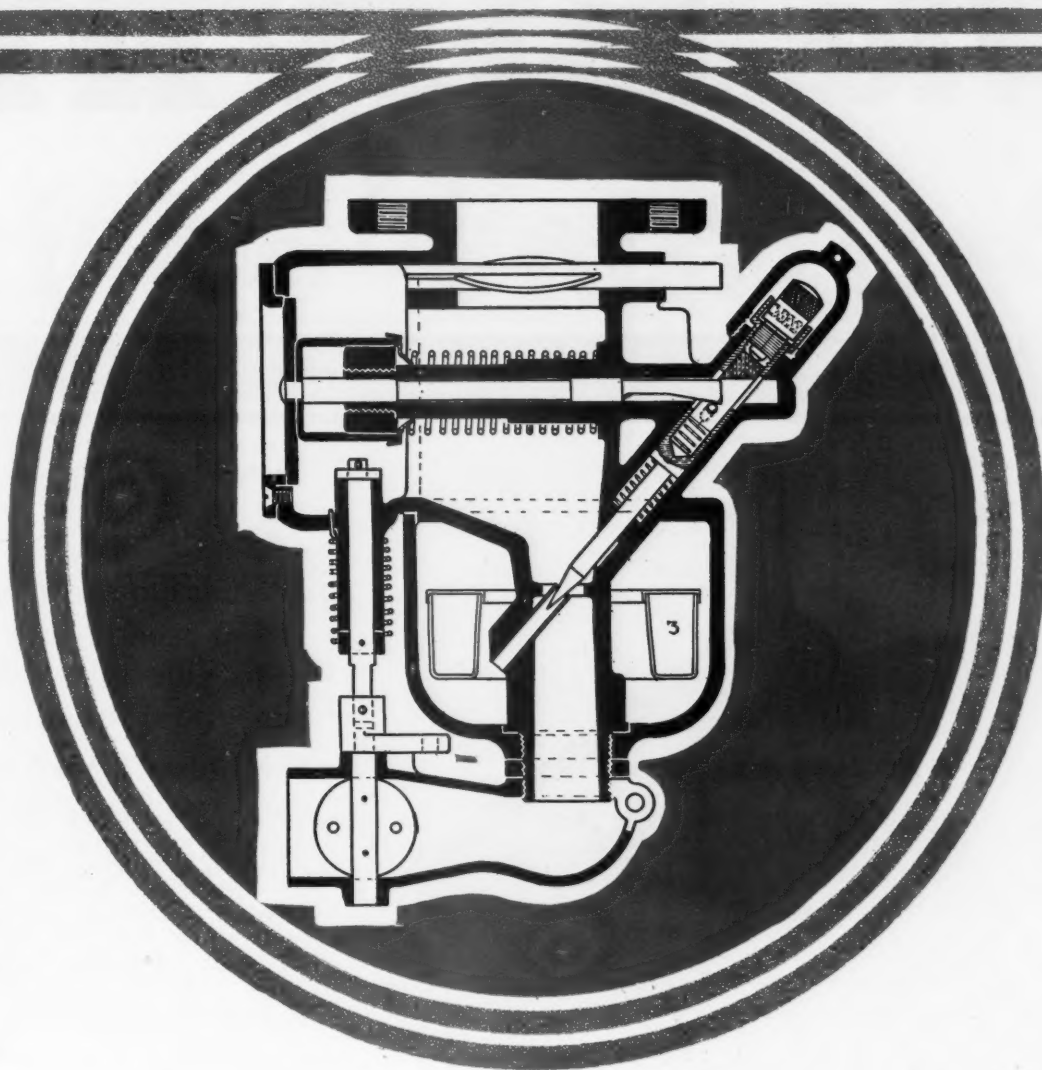
The "MADE-TO-ORDER" CARBURETOR

Economical fuel consumption—without sacrifice of motor efficiency—is the ideal all carburetor makers strive to attain, and it is accomplished by the MUIR in this way:

On the end of the air valve stem is a cam which controls the movements of the needle valve. One moves automatically with any change of the other. Thus the relation between the air and gasoline supply remains at a fixed ratio until such time as local conditions make a change of adjustment seem necessary.

This automatically fixed relation of gasoline and air is not an exclusive feature of the MUIR CARBURETOR—it is, however, a decided advance over any other design.

The way the shape of its control cam is determined constitutes the reason why every car should be equipped with a MUIR CARBURETOR.



MUIR

CARBURETOR

The shape of the cam is determined by the requirements of the particular type of motor the MUIR is to serve. With the motor running on block tests a special measuring instrument is applied to the MUIR by which extremely accurate records of both air and gasoline adjustments are made. These records, when laid out graphically, show the exact shape the cam control should be to give the most efficient and economical results in its work of establishing and controlling the quality of the mixture.

With this adjustment established in actual tests by experts, nothing remains for the driver to do except, possibly, to make a simple adjustment of the flow of gasoline according to the requirements of local driving conditions. Inasmuch as all adjustments requiring skill are made at our factory according to efficiency tests, you will never hear complaints from your owners if your cars are equipped with the MUIR CARBURETOR. Write for new descriptive booklet just off the press!

MUIR COMPANY, Inc.

DETROIT, MICH., Dime Bank Bldg.

BALTIMORE, MD., Equitable Bldg.

The Buying Mediums of the

The Buyer's Guide



"It Hangs
Everywhere"

THIS medium reaches the Buyers economically. Stays with them continuously.

Buyers of everything—everything that is used in the manufacture and maintenance of cars and trucks—have learned to depend upon this authoritative guide. It is the compendium of the industry.

THE AUTOMOBILE TRADE DIRECTORY reaches every professional buyer of your product and it is used by these buyers when they are in the most responsive mood—when they are ready to buy and need only information.

THE Directory and Mailing List—one a buyer's guide, the other a seller's index—complete a business system. With the use of these mediums you can concentrate your

THE AUTOMOBILE TRADE DIRECTORY 24

When Writing to Advertisers, Please Mention Motor Age.

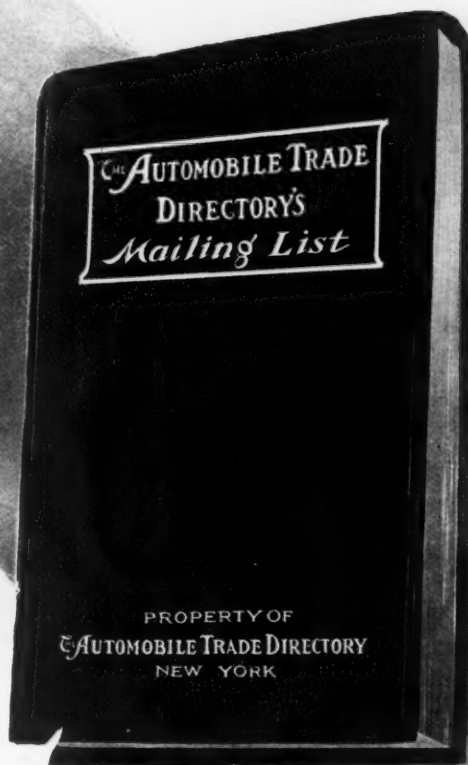
and Selling Automobile Industry

THE Standard list of those who sell to the automobile trade. It embraces the entire purchasing power of every phase of the automobile and motor truck industry, comprising the dealers, garages, repair shops, supply houses and Purchasing Agents, Engineers and other officials of automobile, commercial vehicle, cycle car and motor manufacturers.

Every name given is a live and legitimate concern or business man, conducting a business as listed. To keep pace with changes both of personnel and activities of various concerns complete supplements and revision sheets are furnished the first of each month.

selling effort to the definite field you wish to reach, and talk to more active buyers for less money than in any other way.

The Seller's
Index



243-249 West 39th Street

NEW YORK

When Writing to Advertisers, Please Mention Motor Age.

Introducing—

The new KISSELKAR

Two-Door “Six”

\$2350

(4 or 5 passenger model)

The KisselKar offers for the first time in America a single compartment open body two-door touring car.

The Society of Automobile Engineers at a recent meeting in Indianapolis unanimously endorsed the prediction that this type of body will become very popular.

There is no question that they are right and that this KisselKar innovation will be extensively copied—the signs are unmistakable.

This unique body has no forward doors. Entrance and exit for both passengers and driver are through large 26-inch doors on either side of the tonneau. There are two individual forward seats with an aisle between, thus allowing easy access to the front seats. The introduction of this new single compartment two-door model is in keeping with KisselKar practice—foremost in all that is practical in automobile construction.



Features that give the KisselKar its individuality

Its distinguished appearance, the long, rakish body, stream lines, distinctive headlights, foreign design front axle, crowned fenders, illuminated running board and instruments, gasoline tank and spare tires in the rear.

Its provision for riding comfort—132 inch wheelbase, 36x4½ inch tires, 2½ inch rear three-quarter elliptic springs, 11 inches of upholstery, and shock absorbers. Its mechanical standards—long stroke motor, four speed transmission, extra efficient brakes, full floating rear axle, Mayo (Mercedes type) radiator, “fool proof” force feed oiling system.

Leadership in Car Design

A Remarkable Power Plant

Leadership in Car Design

- Statistics prove that the KisselKar was the first to use three-quarter elliptic springs,*
- first to use an arched frame over the front axle,*
 - first to use a "one man" top,*
 - first to use four speed transmission in a medium price car,*
 - first to use selective type of transmission in a medium price car,*
 - first to use full floating rear axle in a medium price car.*

Others have from year to year recognized in this and other KisselKar improvements correct mechanical principles and advanced construction in the most flattering manner—by imitation.

The KisselKar is a Superior Automobile

In the grace and beauty of its lines, convenience and luxury of its appointments, ease and comfort of its riding qualities, the capability of its motor, completeness of its equipment, the KisselKar is a superior automobile.

The purchaser of a KisselKar will have an unusually easy riding car—the result of liberal design; a strikingly handsome car, an engine of remarkable responsiveness, ample power and flexibility that practically removes all necessity of shifting gears.

Seven Years' Experience in Building Sixes

KisselKar sixes have reached their present stage of efficiency and refinement through a period of seven years of experience in building sixes. The utmost result of this experience is now being passed on to you in the present series of KisselKar sixes, the embodiment of the latest and best ideas in six cylinder construction.

A Remarkable Power Plant

Then there is its Kissel-built unit power plant—compact and accessible, 4 inch x 5½ inch motor, smooth running and responsive, powerful and at the same time economical.

Its simple operation, left-hand drive, centre control, electric self-starter operated by foot plunger, ignition and lighting in separate units, cone leather faced non-slipping and non-grabbing clutch with adjustable spring inserts.

Its completeness of equipment—the "one man" top, one piece ventilating wind and rain shield, Klaxet horn, Warner speedometer and every other high grade accessory.

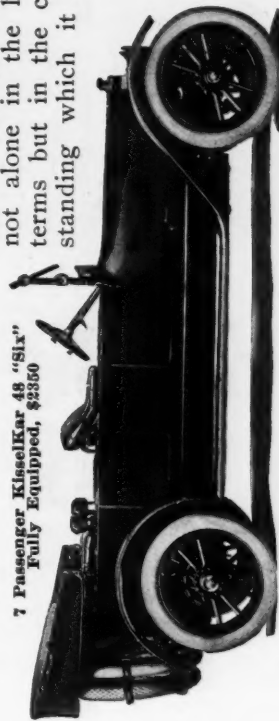
The KisselKar Makes Good in Service

Remember, while comparing the features of this car with others, that it is a manufactured car, built in all its mechanical essentials under one roof. It is a car from which you are rightly led to expect great things and which will exceed expectations.

Enjoy the thrill of a demonstration in this superior "Six." Drive it yourself. Realize the pleasure of genuine riding comfort and an engine over which you have complete mastery. Its price is but \$2350, five or seven passenger body, or the new two-door body with individual seats. With wire wheels, \$70 additional.

And finally, look to Service after the sale. The KisselKar policy of **Service Defined** is something new—not alone in the liberality of its terms but in the complete understanding which it establishes between buyer and seller.

7 Passenger KisselKar 48 "Six"
Fully Equipped, \$2350



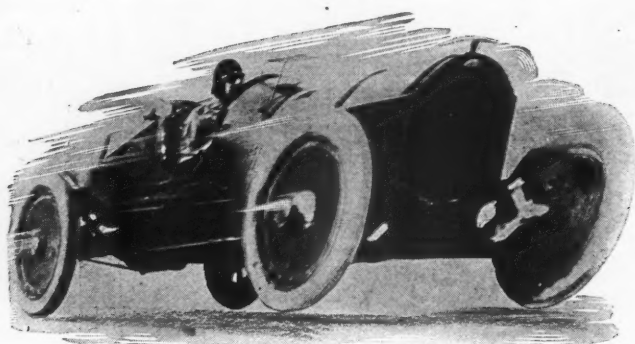
Write for further information and literature and name of nearest dealer.

KISSEL MOTOR CAR COMPANY

121 Kissel Avenue, Hartford, Wisconsin

Boston, New York, Chicago, Milwaukee, Kansas City, Minneapolis, St. Paul, Dallas, San Francisco, Los Angeles, Oakland, Philadelphia, Salt Lake City, Detroit, St. Louis, Houston, El Paso, New Orleans, Washington, Baltimore, Nashville, Duluth, Buffalo, Pittsburgh, Hartford, Conn., New Haven, Albany, Rochester, Providence, Manchester, St. Paul, Minn., Omaha, Hastings, Neb.; Madison, Montreal, Quebec, Toronto, Winnipeg, Calgary, and 800 other principal points throughout America.

The Easiest Riding Car In The World



May
30th

The Great 500 Mile Race Day at Indianapolis

To the wide awake—up and doing—motor car dealer:

We have something to tell you on *Marmon days* well worth the trip to Indianapolis.

For months we have been quietly preparing to greet a host of representative dealers *with a new and greater MARMON proposition*, and the first practical sales system for marketing high class motor cars.

We have been carefully studying the maker-dealer relation and the trade practices now common in American motor car distribution.

The time is opportune for a *step forward* in the retailing of motor cars.

We will have something of unusual interest to say to you on this important subject.

The MARMON "48" and "41"—great cars—supreme products of this corporation, which *always has and always will build supreme quality cars*. We will show you these wonderful cars on these two Marmon days. Will you please consider this an

urgent, cordial invitation to be our guest at the factory on either of these two days.

To make a better car, to find a better way to sell it—is an achievement.

We are confident that you will concede that we may take credit for this real achievement before you say "good-bye" at our front door.

Many hundred good motor car merchants are not wholly satisfied with either the cars they have had to sell, or the methods or system by which these motor cars are merchandised through the dealer to the ultimate consumer.

Progress in this industry cannot stop at mechanical improvement. Merchandising methods must advance with equal strides to develop a mutually *sane and scientific* plan of selling good motor cars and *keeping them sold*.

The automobile merchant who values his commercial standing, who rates good-will as a real asset and builds on the foundation of honorable trading, will see the point.

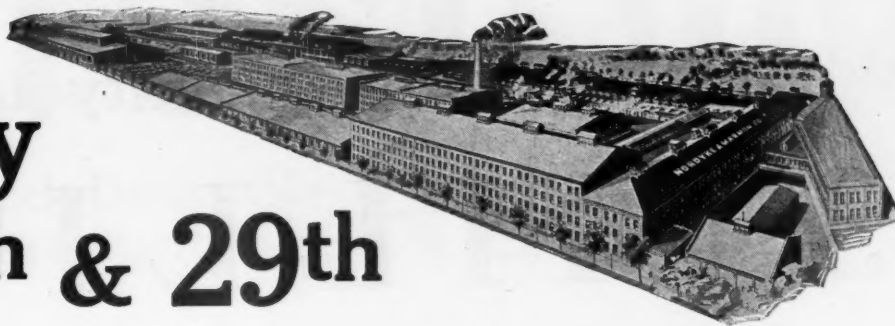
Nordyke & Marmon Company
Indianapolis (Established 1851) Indiana

Sixty Years of Successful Manufacturing

When Writing to Advertisers, Please Mention Motor Age.

The Easiest Riding Car In The World

May
28th & 29th



The Great MARMON Days at Indianapolis

Nordyke & Marmon Company had been manufacturers and merchants *for over half a century before the automobile business became a commercial proposition.* The Company has manufactured and sold the highest type of automobiles since 1904.

It is so easy to print much and produce little; the better way, as we see it, is to *show you* the product, to *tell you* our proposition "face to face"—"man to man"—we know this will appeal to the best type of automobile merchants who will gather in Indianapolis during race week.

You may have one or more agencies and good cars *today*—will you have them *next month* or *next year*?

When you come to the race—why not grasp this opportunity to compare the *permanent* asset and profit of the Marmon proposition with any other assurance you may have for the future development of your business?

Many a good man who sells good automobiles for a living and a profit will make this little note on his desk pad dated the day before he leaves for our town—

"See Marmon in Indianapolis"

It's a suggestion to you. We will make your visit pleasant, agreeable and perhaps *very profitable.*

Shall we meet you at the train?

To Dealers and Owners

It might interest you to learn how the highest grade motor car in the world is made. A competent staff will be ready to take you through our factory and show you how the Marmon "48" reaches the final inspection.

Nordyke & Marmon Company
Indianapolis (Established 1851) Indiana

Sixty Years of Successful Manufacturing

When Writing to Advertisers, Please Mention Motor Age.

A World's Record of Quantity and Quality

33-MILLION

F & S BALL BEARINGS

Produced from 1895 to 1914

By

Fichtel and Sachs

Schweinfurt a/m Germany

The oldest and largest special Ball Bearing Plant in the World,
employing 4000 hands—

Daily output 20,000 to 25,000 Ball Bearings.

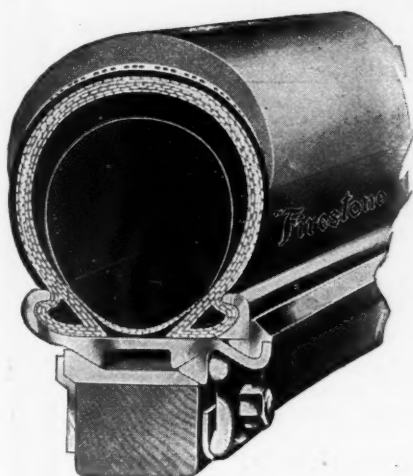
The result of correct design, proper material, good workman-
ship, splendid service and popular prices—

BRETZ COMPANY
Sole Importers
*250 West Fifty-fourth
New York*

Firestone

Quick-Detachable
Demountable **RIMS**

Why We Are Leaders in the Rim Business



Type "A"

The Standard Rim of America. Quick-Detachable Demountable. Fits any Standard Clincher or Quick-Detachable Clincher Tire.



Type "C"

America's leading Rim for Straight-Side Tires. Quick-Detachable Demountable. Fits any Straight-Side Tire.

Because, many years ago, having standardized the Firestone Tire, we wanted to standardize the Service that the tire would give. Tires give maximum service only when they are properly fitted to a rightly constructed rim.

So the "pioneer thinkers" and planners of the Firestone organization "went to it."

Having solved tire problems, one by one, up to the rim service, these pioneers of improvements knew every pitfall of principle and construction to avoid.

A rim was designed, produced, tested and tested some more.

It must be strong beyond all requirements of emergency, yet free from bulk and excess weight. The most expensive steel and the Firestone design accomplished this.

It must protect the inside of the tire and tube from moisture and grit.

It must protect the tread from needless grind and the whole tire from continuous side strains by affording a perfectly true seating for the tire—making it run round instead of "wabbly."

That's why all local wedges were abandoned in the Firestone design. The Firestone Rim sets on a continuous wedge ring. That takes up wheel vari-

ations, prevents "give" of rim anywhere. Insures true seating and round traveling.

It must be easily handled, quick-acting, both in the demounting feature and the detaching and applying of the tire. There must be few parts and no parts must "stick."

The Firestone design was a revelation of simplicity. All holding parts beveled so they couldn't stick and nothing to "operate" but six nuts to loosen and tighten.

And passengers must be safe from the dangers of throwing a tire, even when it is suddenly deflated.

The design of the Firestone valve sleeve solved that.

Then wheel parts must be standard, so car manufacturers can equip for clincher or straight-side, as specified, or car-owner can change any time.

Firestone pioneering was equal to that great step ahead. Firestone wheel equipment is standardized. Put any type of Firestone rim on the same fellow band.

These are some of the vital reasons why we are leaders in the rim business.

They didn't "happen" all at once—these remarkable Firestone Rims of today. But just as Firestone Rims are the standard of today—so were they the standard of five years ago—as far ahead of the next-best then as our refined product is far ahead of the next-best now.

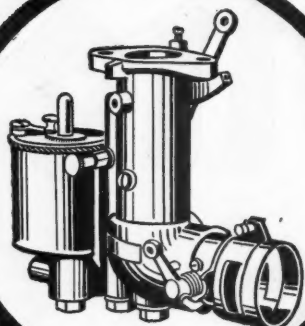
And results of service answer the question even more emphatically—

Firestone Rims Are Now and Have Been for Years Standard Equipment on a Long List of America's Leading Cars. And the List Is Growing Fast.

Firestone Tire & Rubber Company, Akron, Ohio—All Large Cities
"America's Largest Exclusive Tire and Rim Makers"

Pneumatic Tires, Truck Tires, Pleasure Electric Tires, Carriage Tires, Cycle Tires, Fire Apparatus Tires, Rims, Tire Accessories, etc.

When Writing to Advertisers, Please Mention Motor Age.



PROVING Three Facts

The three most important points in proving the superiority of a carburetor for standard equipment on high grade cars are

1st, Performance—The Zenith Carburetor, in taking first prize in the recent Benzole trials conducted under the strict surveillance of the German War Office, makes this claim with certainty.

2nd, Permanence—For seven years the Zenith has remained unchanged in principle and unequalled for its trouble proof simplicity. The absence of all moving parts makes permanence assured.

3rd, Reputation—Used on more than 150 of the famous cars of Europe, the Zenith is known for its efficiency wherever motors run. What Zenith users know makes the Zenith reputation.

Automobile manufacturers can secure all three of these big features—and many more—with the famous Zenith. Why not build sales with the best?

ZENITH CARBURETOR CO.
DETROIT, MICHIGAN.



The New R-C-H

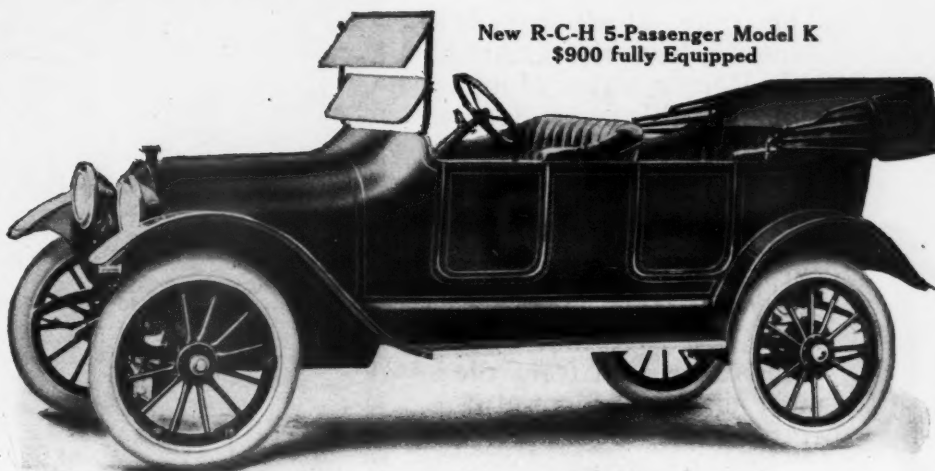
\$900

Fully Equipped



Ward Leonard
[Two Unit Electric
Starting and
Lighting System]
\$100 Extra

New R-C-H 5-Passenger Model K
\$900 fully Equipped



A New Company—A Better Car

The new R. C. H. a better car than ever before. Now manufactured by a new company well financed and ably managed.

Two essentials in motor cars are demanded by automobile dealers and buyers—a good car backed by solid and permanent manufacturers. These things are assured in the NEW R. C. H. The officers and directors of the new R. C. H. Corporation are successful business men who believe in the future of the R. C. H., whose sound business judgment guarantees that the new R. C. H. is a good car all the way through.

Strong Men in Company

This list of officers and directors of the new R. C. H. Corporation is your guarantee of the integrity of the company and the permanence of the car.

President and General Manager, Chas. F. Sieder, who is president of the Sieder Manufacturing Company, Detroit's largest exclusive auto-top factory.

Vice President and Assistant General Manager, Albert H. Collins, formerly sales manager of other large automobile companies, Michigan and Indiana distributor for R. C. H. cars.

Secretary and Treasurer, Allen F. Edwards, vice president Detroit United Railway, director Union Trust Company.

Sales Manager, V. S. Hibbard, formerly assistant sales manager, R. C. H. Corporation.

Service and Purchasing: T. F. Draws, formerly of a prominent local automobile company.

Directors: Henry Russel, chief counsel Michigan Central Railway Company; Burnham S. Colburn, director People's State Bank, Union Trust Company, Canadian Bridge Company.

R. C. H. Dealers Enthusiastic

The R. C. H. has been a good car. To this fact over 10,000 owners, hundreds of automobile dealers and motorists will testify. When we announced to former R. C. H. dealers that we would continue to make these cars, the great majority enthusiastically told us that they wanted the

agency. This fact speaks volumes for the service that R. C. H. cars are now giving.

The new R. C. H. car is a better car than ever before. Up to the minute motor car engineering has shown us where we could make the new R. C. H. better and yet retain all the good of the old R. C. H.

A Big Handsome Car

Meeting the demands of modern car practice, the new R. C. H. has the handsome streamline body, tapering hood and rounded radiator developed to a rare degree of beauty. Cowl dash, large, U shaped doors, extra large seats, stylish fenders and many other features all combine to make the new R. C. H. a car of beauty and comfort.

And with this beauty we give you perfected mechanical excellence. The tried and proved R. C. H. motor and chassis have been bettered.

No Car More Thoroughly Road Tested

The new R. C. H. cars receive the most severe tests before they leave

the factory. Motors, rear axles and transmissions are first tested before they are assembled in the chassis. Then they receive a hard road test, by three different testing crews. No car is more thoroughly road tested than the new R. C. H.

Quick Deliveries

Our factory facilities are complete. Today we are shipping cars to many dealers who are already convinced of the remarkable value we are offering in the new R. C. H. cars. Deliveries will be promptly made as we will only contract for the number of cars that we can build.

A Great Car at a Low Price

Instantly the price of the new R. C. H. guarantees to it a ready market. A more than completely equipped five-passenger touring car for \$900.00. This is a rare value that you will immediately recognize when you see the list of specifications. Automobile buyers are waiting for such a car.

A Startling Dealer Proposition

Here is a car that will make good for you in a big way. The car is right, the price is right—a winning combination. The R. C. H. sales proposition is radically different, a new departure that is right for the dealer. We can back you up in the right way. Let us hear from you immediately. At least investigate our proposition.

R-C-H Corporation
107 Lycaste St., Detroit, Michigan, U. S. A.

The Car Pre-eminent

The only stock car in America using the remarkable Rotary Valve Motor. Added to this pre-eminent feature—a chassis of unusual strength and working smoothness—a body of distinguished grace and surpassing comfort—with every desirable accessory. Here is a SIX that commands attention from the most discriminating. Literature upon request.

**The Speedwell Motor Car
Company**

Dayton,

Ohio



When Writing to Advertisers, Please Mention Motor Age.



A Tip to Dealers

Coxajusto
ADJUSTABLE TO ANY LOAD

Shock Absorbers

are as big money makers as they are comfort producers. Every automobilist needs these only adjustable spring shock absorbers. They are necessary equipment. That's why you should get in touch with the car owner, no matter how well pleased he was with the machine when first bought. There are a great many who want shock absorbers that have not reached the point of purchasing. Only a few suggestions concerning the merits of Coxajustos will be necessary to sell to these people. The adjustment feature found only on Coxajustos placed them head and shoulders above all others. A turn of the cap at the base of the absorber adjusts it to the load. A simple twist of the wrist does it. Only takes a minute. Locks with a dog. Can't slip.

Write for our Selling Plan today. There is big money in it for you.

Heavy Car Type, \$25 to \$35 a Pair
Special Ford Model, \$10 a Pair

Address Dept "A."

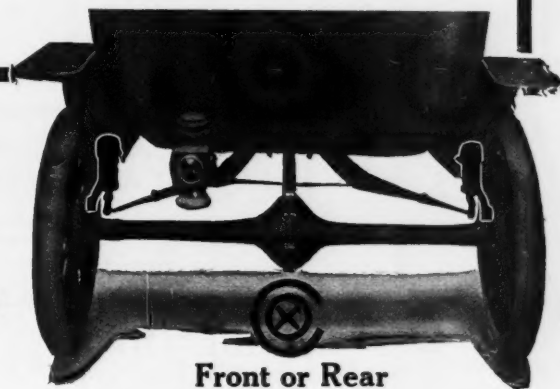
COX BRASS MFG. COMPANY

Established 1872

ALBANY, N. Y.

1777 Broadway, New York City. 2837 Michigan Ave., Chicago, Ill.
899 Boylston St., Boston, Mass. 870 Woodward Ave., Detroit, Mich.
1216 Van Ness Ave., San Francisco, Calif.

AUTO SUPPLIES EXPORT CO. (Export Representative)
1779 Broadway, New York City



Front or Rear

Dry, squeaky, rusty springs are jolting this car to pieces. This kind of car is known as "the repairman's delight."

ISN'T THIS
AWFUL!!

Squeal
break

Squeak

Sqz!!
*
Squeak

**COMFORTABLE
AS A ROCKING
CHAIR!**

This car's springs are equipped with DANN Insert. They can't dry, squeak or rust. DANN Insert keeps spring leaves smooth and slideable.

Why Cars Wear Out

Car springs are interposed **between** the road and the car's more delicate mechanism to **protect** that mechanism from direct road jolts and jars. One

points of the springs' leaves are rarely reached in that way. Even if they are reached, they won't stay lubricated because there is nothing at these bearing points to retain the lubricant. It quickly squeezes out.

Dann Insert is
et that will retain
aves **indefinitely.**

the only device on the market that will retain lubricant between spring leaves **indefinitely**. It provides **thorough and continuous** spring lubrication. Dann Insert is a thin, perforated, lubricant-packed strip of metal designed to be inserted from tip to tip between spring leaves. A spring equipped with Dann Insert has practically 10,000 oil pockets in its construction. The lubricant in these oil pockets cannot squeeze out because the pockets are practically hermetically sealed. Cars equipped with Dann Insert do not wear out prematurely because their springs retain **permanently** the flexibility and vibration absorbing qualities the car manufacturer meant them to retain.

X-Ray view of spring equipped with Dann Insert, showing how the oil-packed strips of Insert are placed between spring leaves

Write for Sample of Insert and Full Descriptive Literature
Dealers Wanted Everywhere

FORD MOTORISTS! The Schaefer Sales Corporation, 1501 Arcadia Building, Detroit, Mich., is prepared to supply the trade and Ford owners with Dann Ford Insert—cut to proper lengths, neatly packed in a box, and ready for immediate installation between the spring leaves of any Ford car. Complete instructions accompany each order, making it an easy matter for you or your garageman to "Oil Cushionize" your Ford springs with the utmost despatch.

"Oil Cushionize Your Springs!"

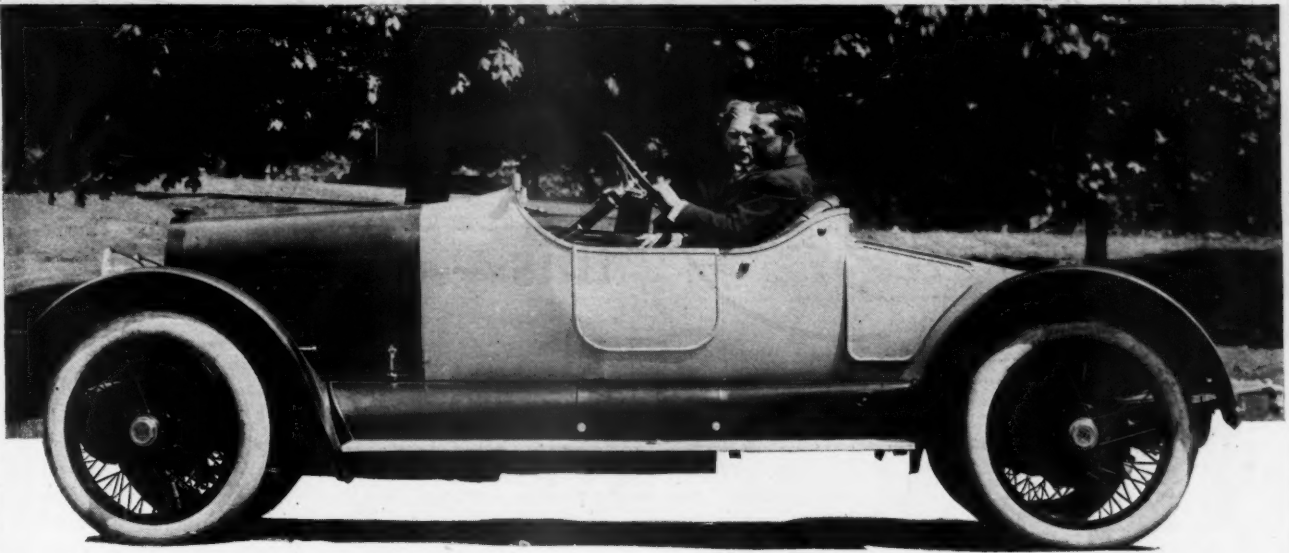
Dann Oil Cushion Spring Insert Co.
2252 Indiana Ave., Chicago, Illinois Spring leaves

**Put Dann Insert on Your Old Car—
Demand It on Your New Car**

Springs whose leaf members are dry, rough and rusty like this, are shock conductors—mechanism killers!

Spring leaves which DANN Insert keeps smooth, shiny and permanently lubricated like this, are vibration absorbers — mechanism protectors!

When Writing to Advertisers, Please Mention Motor Age.



Announcing the 1915 Series Premier 6-49 \$2385

The Premier 6-49 is a car of distinction and quality. The electric lights, starter, left side drive, one-man top, deep, soft upholstery and comfortable riding qualities make it the buy of the season. Nothing but the best enters into the construction and equipment of Premier, and only through the fact that its popularity has permitted a low selling cost are we able to offer a Premier at \$2385, the best in every respect, at the price of a high-grade four-cylinder car.

The New Standard of High-Grade Automobile Value

*You are cordially invited to inspect our new series
while in Indianapolis attending the big race*

PREMIER MOTOR MFG. CO.
Indianapolis



Discomfort

Mud

Injury

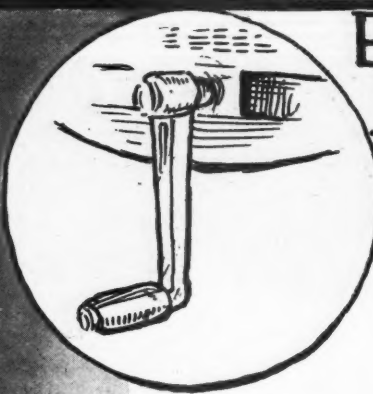
Rain

Danger

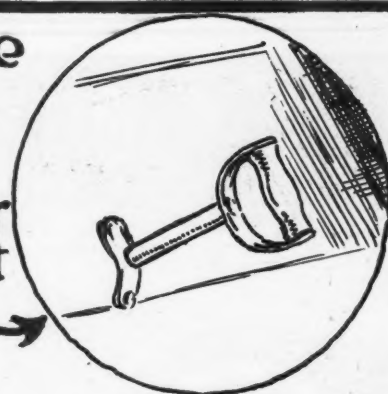
Chagrin

Worry

Temper



Every time
you use
this
think of
this



"King of the Movies"

Did you ever think what an interesting moving picture you made when you acted the principal role in the picture shown on this film? We can remember when the street urchin laughed at the one-lunger and cried, "Get a horse." To-day he confines his attention to the man who "cranks." Why?—**Because cranking is obsolete.**

All really modern cars are self started except Fords. They are in every other sense modern, efficient, and highly reliable. In fact they have but one deficiency and that has been remedied by the

BOSTON STARTER

Many thousands of these starters are now giving highly reliable and perpetual service on as many Ford cars. Their owners would not part with them at any price because they are the one finishing touch which makes the Ford car perfect.

THE BOSTON STARTER is remarkably simple in operation, highly efficient, easily operated, quickly installed, ever ready and costs \$25 complete ready to install (F. O. B. Boston).

The dealers who are handling these starters find them a highly profitable investment because of the large demand for them. Every Ford owner in your territory is a customer. If you are not selling BOSTON STARTERS get in touch with us at once.

Dear Mr. Ford Owner:—

If your dealer can't supply you with a BOSTON STARTER write us at once and you will get our interesting booklet, or you may send your check for \$25 and we will express promptly.

Automatic Appliance Company 172 Columbus Ave.
BOSTON MASS.

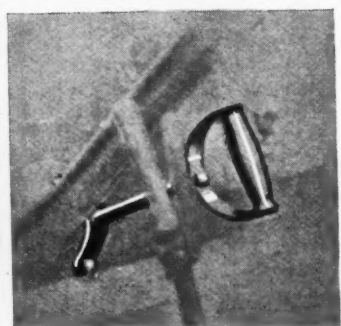
New York Office, 1876 Broadway

LIST OF DISTRIBUTORS:

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738 Morgan Bldg.
LOUISVILLE, KY.,
Boston Starter Company
of Kentucky
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SAN FRANCISCO, CAL.,
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DENVER, COLO.,
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RICHMOND, VA.,
Cheml Company,
629 E. Main Street.
AUTOMOBILE SUNDRIES
CO., 18 Broadway,
New York, N. Y.
Sole distributors for export.



\$12



Get this "Stewart" Speedometer for your new "Ford"

THE minute you buy your Ford car, have the dealer attach this new Stewart Speedometer designed especially for Ford Cars. Don't drive a single mile without a Stewart Speedometer.

This Stewart costs only \$12 complete, including installing it on your car at any of our Branches. \$12 is the lowest price at which a magnetic type speedometer for automobiles has ever been sold —

This Stewart Speedometer costs less than the fine for speeding you're liable to, every second you drive without this "Stewart."

This Stewart Speedometer costs less than the money you're certain to lose in tire adjustments if you haven't got a "Stewart" to prove to the dealer that your tires gave out before being run their guaranteed mileage.

This Stewart Speedometer costs less than the money you soon waste on gasoline and oil if you can't watch "Miles per gallon" with your "Stewart" and keep the Ford running at greatest economy.

You'll miss the pleasure and satisfaction of having your "Stewart" tell you exactly how fast and how far you go and keep check on the routes in touring.

You've got to have a "Stewart" to enjoy your "Ford." It's a genuine, high-grade, magnetic type

"Stewart" — in principle, material and workmanship. Stewart Speedometers are carried on more than 95% of all the automobiles in use. Over 1,500,000 sold and used on all high grade cars.

This Stewart Speedometer for Ford cars has regular 60 mile, rotating speed dial—odometer with 10,000 mile season register and 100 mile trip register with reset device—jeweled bearings—silver etched dial face—French plate dial glass—case in deep jet lacquer with polished brass trim to match your Ford.

If your Ford dealer cannot supply this Stewart Speedometer, you can buy it from any jobber, supply dealer, garage man, or direct from any of our branches or service stations. At our branches the installation will be made *free*.

Don't wait. Don't put it off. Get a "Stewart" the very same day you get your "Ford."

Stewart-Warner Speedometer Corporation

Executive Offices: 1931 Diversey Blvd., Chicago

Factories: Chicago and Beloit, Wisc.

17 Branches. Service Stations in all cities and large towns.

**The Interstate
Bulletin
has
Money Making
News
for Every
Live Dealer**

Inter-State BULLETIN

**Indianapolis
500 mile Race
May 30**

**Visit us then
and get our
Proposition**

Volume 1.

MUNCIE, INDIANA, MAY 21, 1914

Number 2.

S O L V E D

MARGIN IN PRICE RELIEVES CONDITIONS

TRADING MADE POSSIBLE BY HANDLING INTER-STATE

That the dealer today must have some way of meeting the present trade conditions and at the same time give the purchaser good value is realized by every hustling dealer in the country.

That the present policy of the Inter-State Motor Company meets these conditions and enables the dealer to trade, make money, and at the same time give the buyer good value, is a fact every dealer should investigate.

HAVE STUDIED TRADE CONDITIONS

The Inter-State company and its new organization after a careful investigation of trade conditions can now give the dealer a proposition which will relieve him and make it practical not only to sell to the man who has never owned a car, but also to the man who must trade in his old car—and do it without loss of profit.

OWNERS

All owners of Inter-State cars made by our predecessors can obtain any service they desire through this department of our factory.

Our Service Department is for your use. We want you to apply to us for advice and help whenever you need it. You will find our methods fair and our dealings with you honest.

We can take care of your car regardless of the year of manufacture.

INTER-STATE MOTOR CO.
Dept. C Muncie, Indiana

NO SACRIFICE OF QUALITY

Because of the extraordinary price for which this new company purchased the modern plant, equipment and stock they now own, they are able to make this proposition without sacrificing the quality of the Inter-State in any way.

At its present price the Inter-State represents the biggest value on the market today. It is the car with something real and tangible behind it.

DEALERS SHOULD MAKE INVESTIGATION

Agents who have found it necessary to turn down orders because trading in old cars was imperative, can, through handling the Inter-State, give the purchaser a remarkably high grade car and still realize a good profit.

Live, hustling dealers will take advantage of the Inter-State policy of doing business.

Investigation will prove that every factor of this proposition is based on experience. The men in this company know trade conditions and how to meet them. The margin in price of the Inter-State is something the live dealer cannot fail to see, will mean more money for him.

TWYMAN MAKES STATEMENT

The Inter-State factory organization as it now stands is in no way connected with the former makers of this car. We purchased only the plant, stock, and good will of the former organization.

The men who have invested their money in this company know our policies are right and mean successful manufacturing.

I want every dealer to investigate our factory, the personnel of this new organization, and our financial responsibility and learn for yourself that our offer is based on legitimate manufacturing.

W. J. Twyman

EDITORIAL

DEALERS FIND VISIT TO MUNCIE PROFITABLE

MANY DEMANDING FIRST CALL ON NEXT YEAR'S BUSINESS

In the past few weeks the Inter-State Motor Company has received visiting dealers from all parts of the country, who have acted on our suggestion to visit the factory and see for themselves what we are doing.

And they have seen for themselves the increased activity of our plant and the great number of cars we are turning out each week—and what is best of all shipping them.

Each week we have been in business has seen an increase in the activities around the plant which speaks well for the confidence the public has in Inter-State cars and the wonderful value of our proposition.

Dealers who have seen and learned what we are doing have accepted our proposition because they know it is right. They see that our car meets the present trade requirements and means money for them.

And those who have seen what we have up our sleeve for next year have demanded that they be given first call on our product.

What Does This Mean to You?

It means this—if you are daily being solicited to trade new cars for old ones and can't afford to do it, come to Muncie and learn for yourself how you can do it by becoming a member of the "Inter-State Family."

VISIT US WHEN YOU ARE AT NEXT 500 MILE RACE IN INDIANAPOLIS

The next 500-mile race will be held in Indianapolis Memorial Day, May 30th. The Inter-State Motor Company at Muncie is only two hours' ride by interurban or train from Indianapolis.

It will pay you to visit us either before or after the race and learn for yourself the money-making value of our proposition and our policy for next year's business.

WATCH THIS BOX

Every time you see the INTER-STATE Bulletin look for this box and find out what we will have to tell you from time to time. There will always be something interesting and profitable for you to read.

Drop us a line today and get our proposition. You will find it means money to you. If you are a live dealer you will become a member of the Inter-State Family now.

INTER-STATE MOTOR COMPANY
Dept. C Muncie, Indiana



REXO II

\$3.85

What constitutes a good warning signal?

The following factors make Rexo II the highest grade, low priced horn on the market

1. One piece construction.
2. Two coats of baked enamel.
3. Minimum current consumption.
4. Our guarantee for the life of the car—It's unique—we live up to it.
5. Long six-inch bell.

That is the Garford position in the warning signal industry.

At this date, over thirty prominent automobile manufacturers have contracted for over 60,000 REXO II warning signals as standard equipment. During the past twelve months over 80,000 TUTO and REXO warning signals were sold. Jobbers have unanimously hailed the REXO II as the greatest selling proposition in the warning signal field.

The REXO II is everything you would expect in a superior warning signal. The price is based on quantity production after quality has been proven.

There will be a big demand for the REXO II, dealers will find it the most profitable accessory in all motordom.

Are you prepared for the spring business?

The special Ford-Rexo II price \$3.85 makes every Ford owner a prospective purchaser.

THE GARFORD MANUFACTURING COMPANY

Successors to The Dean Electric Company, 2504 Olive St., Elyria, Ohio, U. S. A.

The Garford Mfg Co.,
Kansas City, Mo.

The Dean Electric Co.,
Los Angeles, Cal.
Sumter Telephone Supply Co., Sumter, S. C.

The Dean Electric Co.,
Seattle, Wash.

Mr. Thomas A. Edison Chooses Houk Detachable Wire Wheels for His Personal Car



The same considerations which influenced this master mind are bound to dominate the selection of motor car equipment by those who think—the kind of men whose actions mould the opinion of others.

Durability first—then efficiency, and after that—beauty. These in their order were the reasons why Mr. Edison selected HOUK DETACHABLE WIRE WHEELS for his Detroit Electric, and these in their order should be the foremost considerations at all times, by all motorists, in selecting the wheel equipment for their cars.

You want the greatest percentage of durability, the greatest percentage of efficiency and beauty, which evidences refinement of taste.

Can a heavy, dead, inflexible wood or steel wheel give the factor of safety—can any wheel be as light, live and flexible as the HOUK DETACHABLE WIRE WHEEL?

HOUK DETACHABLE WIRE WHEELS add greatly to the comfort of motoring by reason of their quick change feature—remove one nut and put on the spare wheel—usually a four or five minute delay.

Progressive manufacturers already offer HOUK DETACHABLE WIRE WHEELS as equipment on their cars. The others you do not care about.

Progressive dealers recommend and show cars equipped with HOUK DETACHABLE WIRE WHEELS.

MANUFACTURED BY

THE HOUK MANUFACTURING CO.
BUFFALO, N. Y.

FOR

GEORGE W. HOUK CO., 1700 Elmwood Avenue, Buffalo, N. Y.

New York Branch: 1794 Broadway

Cablephone

A Mechanical Horn Operated By Cable



The Latest Achievement in
Hand Operated Horns

PRICE

Including All Attachments

\$7⁰⁰

Three Year Guarantee

Experience has taught the motorist the advantages of a reliable Hand Operated Warning Signal—one that can be depended on at all times to produce a sound sufficiently loud and penetrating to be heard above the din and clamor of city traffic.

We have incorporated these features in our **Cablephone**.

One end of the chain or cable is attached to a grooved member inside the case. The other end to the wheel or any convenient place, whereby with a slight pull of the chain a deep voluminous warning is emitted.

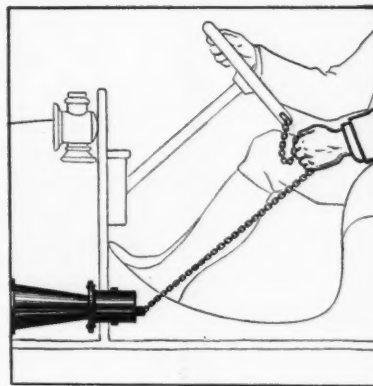
Manufactured and Guaranteed by

Automobile Supply Mfg. Company

220 Taaffe Place

BROOKLYN, N. Y.

America's Pioneer Auto-Horn Maker



*It is Operated by a Slight,
Easy Pull of Cable
Chain*

THAT'S ALL

SIMPLE IN CONSTRUCTION

MECHANICALLY PERFECT

Wears Well—Warns Well

Prompt Deliveries in Quantities



You probably have never realized the very important part that heat treating plays in the use you get from the different parts of your automobile.

In the Hyatt factories every piece of steel is given a uniform and scientific system of heat treatment that increases its strength and wearing qualities in an almost unbelievable manner.

This is one reason for the wonderfully care free service rendered by Hyatt Quiet Bearings which are used by the most prominent automobile manufacturers.

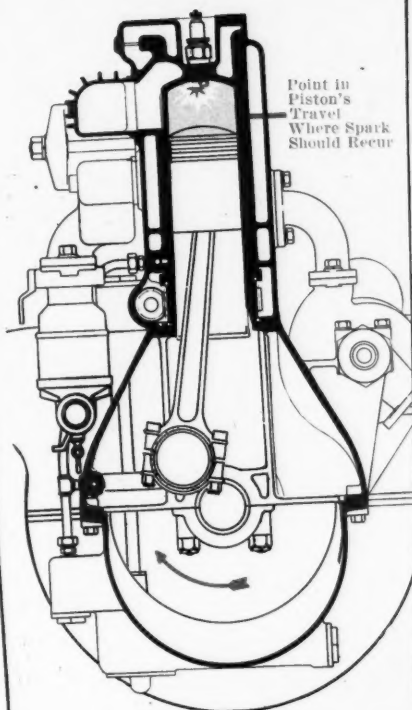
Two books, one about motor car bearings in general or prospective purchasers, the other for automobile owners, will be sent on request.

"Hyatt Quiet Bearings"

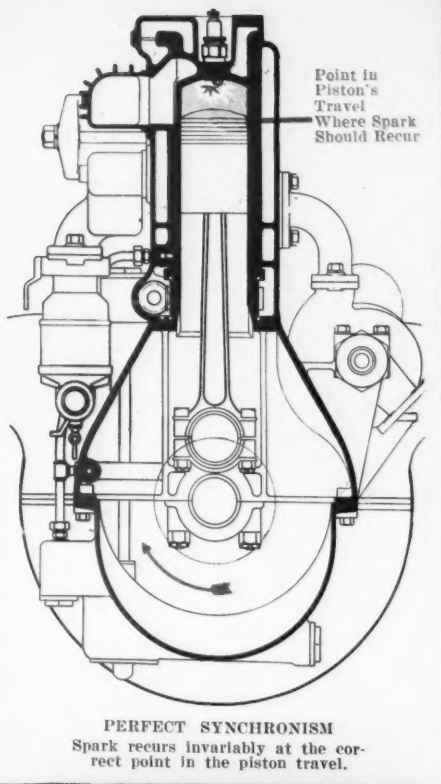
HYATT ROLLER BEARING Co.
DETROIT, CHICAGO
NEWARK, N.J.



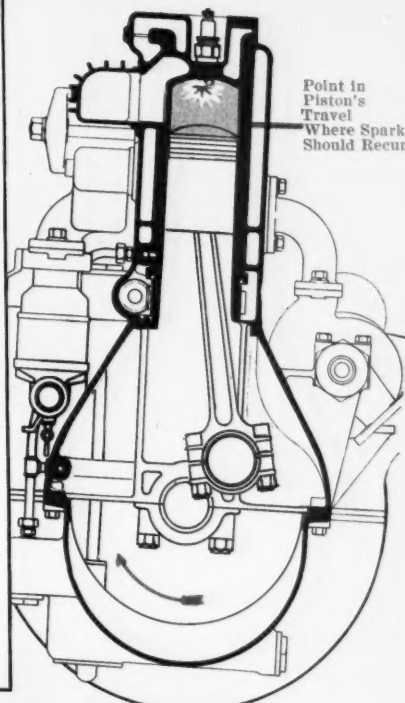
CONNECTICUT AUTOMATIC IGNITION



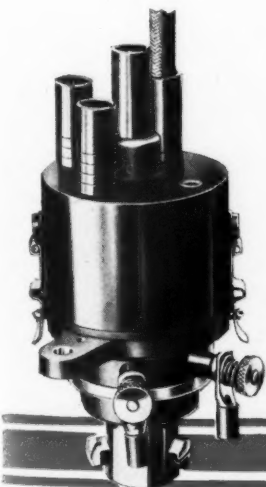
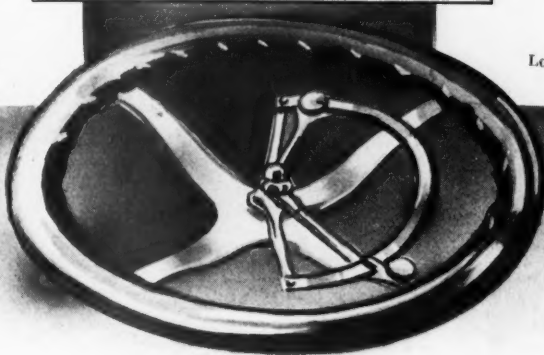
LACK OF SYNCHRONISM
Loss of power always results from a spark occurring too early.



PERFECT SYNCHRONISM
Spark recurs invariably at the correct point in the piston travel.



LACK OF SYNCHRONISM
Loss of power always results from a spark occurring too late.



Igniter assembled, Furnished with either vertical or horizontal terminals.

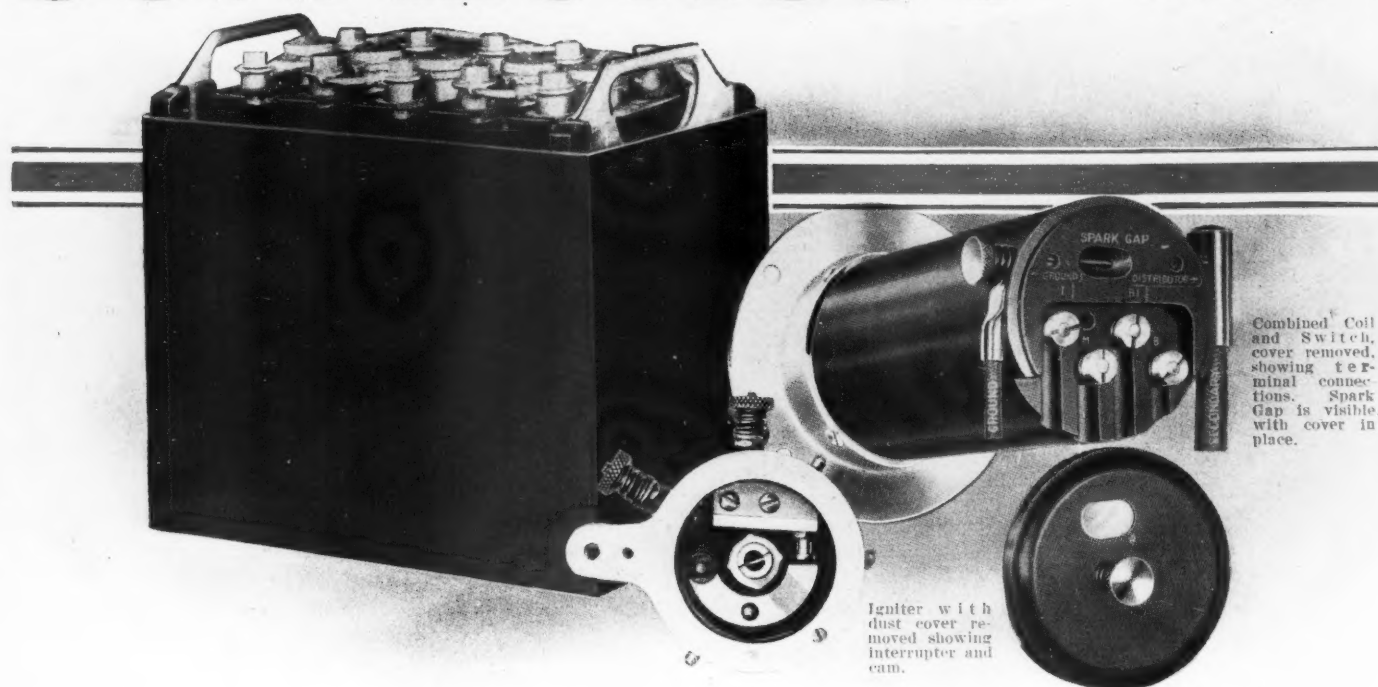
THE first question which presents itself in your investigation of any ignition system should be that of *synchronism*—or the invaluable recurrence of a spark at the same point in the piston's travel with a set spark adjustment.

Synchronism has a direct bearing upon flame propagation, or the time consumed igniting a full charge of gas. Practically every motor experiment in the last couple of years has proved the direct bearing of flame propagation on motor efficiency, and that the greatest horsepower can be obtained only when flame propagation, or the explosion, occurs at a fixed point in the piston's travel.

Flame propagation with a spark delivered *synchronously* is dependent on the quality of the spark.

CONNECTICUT AUTOMATIC IGNITION gives absolute *synchronism* under every condition. It employs a breaker box of the magneto type and steps up the current through a transformer coil like the magneto. Other details of design and construction, however, vary radically from precedent, for only along different lines is it possible to produce a spark of sufficient quality to meet every condition—starting, slow going, hill climbing, heavy pulling, touring, etc.

CONNECTICUT AUTO

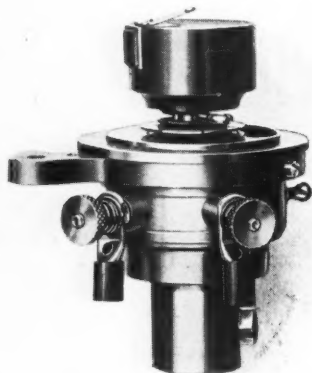


Flame propagation, with a spark delivered synchronously, is always dependent upon the quality of the spark.

to insure thorough saturation of the primary coil. When the break occurs, the primary circuit is broken from maximum saturation to zero, therefore inducing the strongest possible high tension current and producing the most intense spark. At slow speed the primary circuit remains closed longer than at higher speeds; this is why the Igniter delivers its most intense spark at slow speed, but even at high speeds the circuit is closed for a sufficient period of time to insure a higher quality spark than is obtainable with any other system.

The Automatic Switch

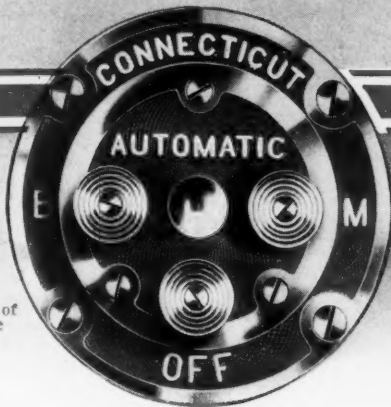
The principle upon which Connecticut Automatic Ignition is designed has been made possible by the invention of the Automatic Switch, a feature that is individual to this system and unique in ignition apparatus. Its function is to kick off the switch should the primary circuit be closed an unwarranted length of time, as in the case of a car being left with the switch on and the engine stopped. This will prevent the draining of batteries.



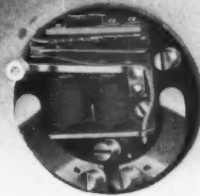
Igniter with Distributor Cap only removed.

Not only does the Connecticut Automatic Igniter possess all the essentials of a perfect ignition system—not only is it free from the limitations of other forms of ignition, but the results it gives always coincide with the requirements of driving—starting, slow going through traffic, touring, hill climbing, hard pulling, etc. Better still, its use with starting-lighting systems is the logical solution of the problem of confining the electrical equipment of the modern automobile to one general system.

CONNECTICUT AUTOMATIC IGNITION



Front view of
Automatic
Switch.



Interior view
of Automatic
Switch.

Lag. All high tension ignition is based upon a "break" in the primary circuit. After the actuating mechanism in the primary circuit is set for firing, the following factors enter before the explosion can occur:

1. The time consumed in mechanically accomplishing the break.
2. Induction lapse or the difference in time between the break in the primary and the occurrence of the high tension spark.
3. The rapidity of flame propagation.

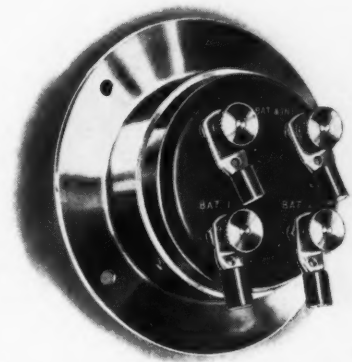
So, the actuating mechanism must be perfect, for the least possible time required to accomplish an explosion becomes a serious consideration—for example: If the time required for any one or all of these actions is as slight as one-thousandth of a second, a motor running at the rate of 2000 R. P. M. will have turned through 12 degrees during that time. Sufficient variation to cause an appreciable loss of power.

This time factor is known as lag.

Good magnetos show almost perfect synchronism at some one setting of the spark lever, but a remarkable lack of synchronism at any other setting. This can be attributed only to the mechanical difficulties in getting a revolving breaker-box absolutely true.

In the Connecticut Automatic Igniter, there is only one rotary relationship to be established, and it is the same in all positions, consequently there is no **mechanical lag**.

In accomplishing the break, the action of the cam on the Interrupter Arm of the Igniter is absolutely positive—the current is broken from maximum to zero and the induction of the secondary or high tension current is instantaneous, consequently there is **no electrical lag**. Contrasted with the intricate electrical action which takes place in a magneto, the simplicity of the Igniter is most apparent.



Rear view of Automatic Switch, showing neat method of making connections.

CONNECTICUT AUTOMATIC IGNITION ITS ADVANTAGES

THE CONNECTICUT AUTOMATIC IGNITION SYSTEM is fully as great an improvement over the present day magneto as the magneto was over the old time vibrating coil.

For Starting and Slow Driving

The Igniter produces its hottest spark at slowest speeds.

On cars equipped with electric starters, the Igniter delivers such an intense spark at starting speeds, that a motor will pick it up and start running under its own power very quickly. This materially reduces the drain on the starting battery.

A hot spark is most necessary when throttled down in traffic or otherwise. Carburetion is universally poorer on low speeds. Under these conditions the magneto turning over slowly produces its weakest spark.

For Touring

While the Igniter produces its hottest spark at slow speeds, it gives a more effective spark on high speed than the magneto is capable of at best.

Flame propagation is accomplished synchronously, due to the superior quality of the spark delivered by the Igniter and its total elimination of lag—either mechanical or electrical—regardless of engine speed or angle of spark advance.

While the range of manual control with the Igniter is unlimited, there are practically but two spark lever positions necessary in driving—retard for starting—advance for running.

For Hill Climbing or Heavy Pulling

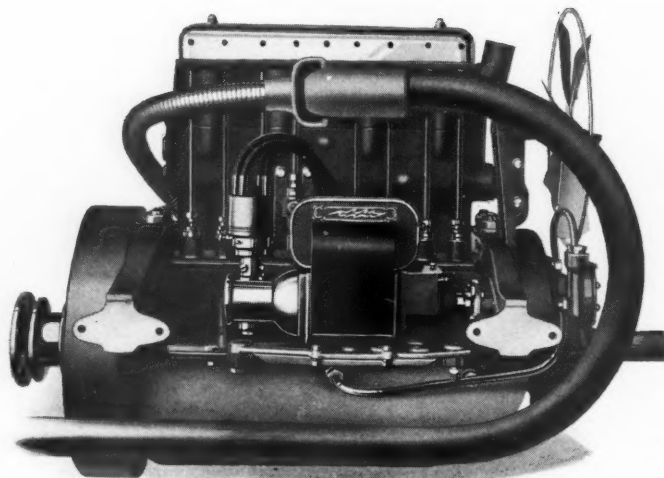
These are conditions where the quality of a spark and absolute synchronism come into play—conditions where the lack of either may mean shifting to a lower gear.

The heavy charge of gas required for hard pulling requires an intense spark and this spark must occur synchronously to give the best results. Here, again, CONNECTICUT AUTOMATIC IGNITION demonstrates its superiority over all other kinds of ignition.

The Ideal Adaption of CONNECTICUT AUTOMATIC IGNITION is in Conjunction With a Generator Supplying Current to a Storage Battery for Lighting and Starting

In this form, the Connecticut Automatic Ignition is the logical complement of a starting-lighting system, as it makes a three-point electrical unit—starting, lighting, ignition—much simpler than any other

type, besides eliminating the expense and attention the magneto and other types of ignition require.



One of the many methods of installation—a two unit starting-lighting and ignition system, where the igniter is combined with the dynamo.

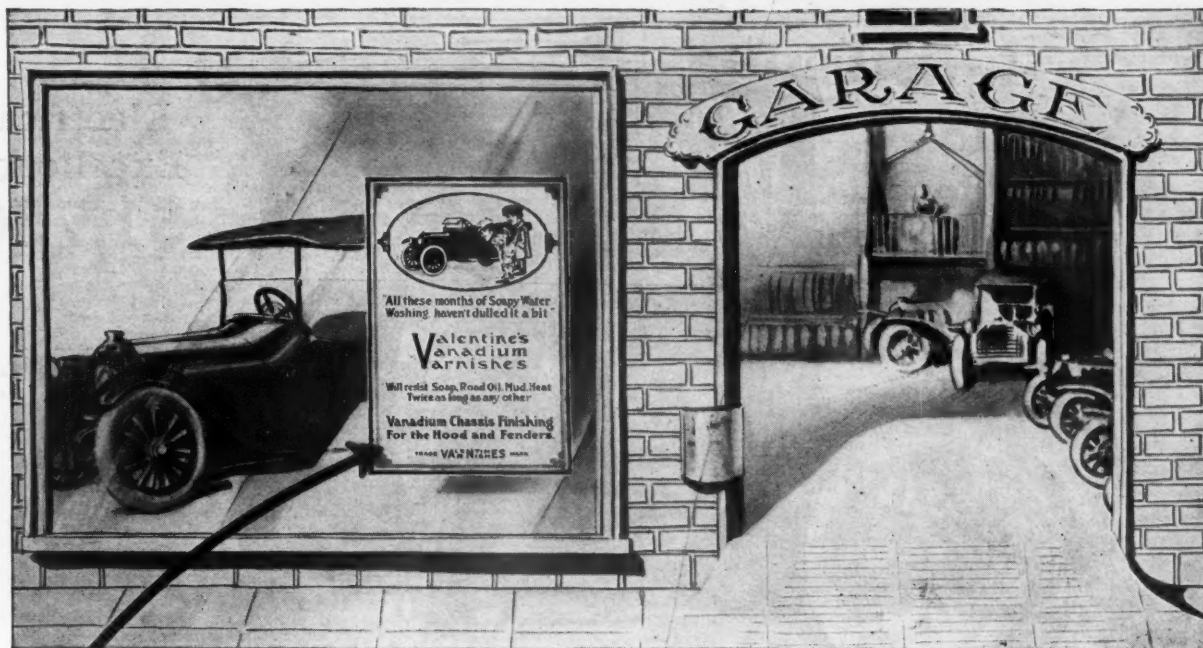
CONNECTICUT AUTOMATIC IGNITION has been tested thoroughly during the past two years on a large number of cars, driven by experts as well as by average drivers. It has been adopted already

by several automobile manufacturers and is endorsed and furnished by prominent starting-lighting system manufacturers.

The Connecticut Telephone & Electric Co., Inc.

MERIDEN, CONN.

Booklet fully describing Connecticut Automatic Ignition, sent upon request



The Sign of a Good Paint Shop

Make sure you take your car to be repainted to a shop where you will get a good job that will last.

There is no better way to judge a good painter than by the varnishes and other painting materials he uses.

This Transparency will be placed in paint shop windows all over the country. It signifies that the painter uses

VALENTINE'S PAINTING MATERIALS

If you see the sign in a garage man's window he will direct you to the right painter.

Valentine's Varnishes and Colors are a little higher in price, but the man who buys them and uses them will tell you they are worth more than the difference to him, in the finer results he secures.

Ask the painter to use Vanadium Chassis

Finishing on the hood, fenders, and under parts of your car. This is the varnish that is not affected by hot or soapy water, mud, road oil, grease, etc. It lasts four times as long as an ordinary varnish.

Write for our booklet, "The Care of the Car".

**Painters and Garages—Send for the
Valentine Transparency—Free**

VALENTINE & COMPANY

Largest Manufacturers of High-grade Varnishes in the World

456 Fourth Ave.
NEW YORK

74 Pearl St.
BOSTON

343 S. Dearborn St.
CHICAGO

TRADE **VALENTINES** MARK

FILL IN—TEAR OFF—MAIL TODAY
VALENTINE & COMPANY, 456 Fourth Avenue, New York
 Send me { "The Care of the Car" [] [M.A.V.C.5]
 "Window Transparency" []
 Name
 Address
 Please send me mat-
 ter checked
 above.

1915 Flanders Colonial

Electrical
Excellence
\$1,750



After Four Years, the Flanders Electric Is Still the Fashion Plate—

FOUR YEARS AGO when the Flanders Colonial Electric first appeared, it was pronounced so radical both in design and in price that it would not meet with approval.

THE DESIGN WAS RADICAL for that time. It was revolutionary in fact.

THE STANDARD THEN was a short, high-perched car and the design of most of them was ungraceful to say the least. Well, you can still see some of them on the streets—they look ridiculous now.

THE FLANDERS SET A NEW STYLE IN CHASSIS—Long, low-hung, with the graceful curves that are the basis of Colonial carriage design.

BUT THAT WASN'T ALL. It was radical in mechanical features also. It had a worm drive—the first that ever had been heard of in this country.

YOU CAN SCARCELY REALIZE—now that the worm drive has become an advertising feature of all high-class electrics, what an onslaught the other makers made on that Flanders worm drive. They said it was impossible—that it was too expensive to manufacture and that it lacked efficiency.

IN FACT THEY SAID all that ignorance and jealousy could say.

BUT—AND HERE'S THE POINT—they watched the worm drive more closely than they had ever watched anything. If it did prove right, it was the solution of one of the most vexing problems in the designs of electrics.

EVERY ONE OF THEM—we don't believe there was one exception—bought a Flanders electric just as soon as they could get one—and they put not only the worm drive but every other part of that car to the severest test they could devise.

THEN THEY LEARNED another important fact—that the car was wonderfully good, wonderfully well made—and that the best materials known to electric car manufacture, went into its make-up.

THEN THEY CAME TO US with some gratuitous advice. They said, it is absolutely foolish for you to offer such a car at the price—it can't be done for \$1,750. It isn't necessary—in fact you will find that the average buyer judges an electric only by the price, and in spite of all you can say or show them, they will be suspicious of the value when you place such a low price on it."

OF COURSE WE KNEW that back of all that good advice was a selfish motive. For if the Flanders electric did succeed—if, in spite of the price it did prove equal or superior in service to cars then selling at twice its price—why of course other makers would have to cut their prices.

WELL, THAT ALSO HAS HAPPENED—you can buy better electrics today for less than two thousand dollars, than you could then buy for \$3,000. And the prices are still coming down.

THEY WILL HAVE TO meet the Flanders in price since they cannot beat it in quality nor equal it in appearance and grace.

MEANTIME ANOTHER INTERESTING thing was happening. While the engineers were testing the worm drive and the general efficiency of the electrical hook-up, the body designers were busy copying the graceful curves and lines of the Flanders Colonial body—trying to get the effect without seeming to copy—and without first having the graceful foundation to work on.

Flanders Electric In
Factory, Pontiac, Michigan

Gen
100

It Is Still the Most Beautiful

LOOK AT THE LATEST MODELS of the different makes—stand them beside a Flanders four years old—and you will find that each has copied or imitated some of the features that made you exclaim when you first saw the Flanders, "that is the most beautiful electric I ever saw."

IT IS STILL THE MOST BEAUTIFUL—the design is still the fashion plate from which other body designers work, just as the worm drive and the other advanced mechanical and electrical features have been the basis for the chassis design of nearly all other electrics.

THE 1915 MODEL of the Flanders electric is now out. We are delivering. And it's interesting to know that, so far, in advance of all others, you can tell only by the closest scrutiny where changes or refinements have been made.

WHY CHANGE when it enjoys the preference—while others are still vainly trying to copy its beauty but are unable to reproduce the artistic effect of the car.

THE SASHLESS WINDOWS, the ground French plate, sans sash in the doors, the motor direct-connected with rear axles which gives the greater efficiency and eliminates the tendency to skid, the "hammock" suspension on soft springs between the two axles, the long wheel base, the electric headlights; those and many other features you now see in some other electrics were original with the Flanders—and the very makers who have copied them were the ones who condemned them when the car first appeared.

BUT THAT IS ALL HISTORY now. What of service? What about the enduring qualities of this \$1,750 electric as compared with those of \$2,500 and \$3,000 electrics. The answer to that tells the story.

TRY TO BUY A FLANDERS of say 1911. See if you can find one for sale. And if you can, find what is the lowest price for which you can buy it.

THEN LOOK OVER THE USED CAR ADS, and note how many of other makes are daily offered for sale. And you'll find you can buy a 1911 model of the highest priced electrics for about half what you'd have to pay for a Flanders of same vintage—if you could find a Flanders for sale at all.

THAT TELLS THE STORY. Endurance. Satisfaction. Beauty—still the handsomest, the most graceful thing on wheels—and the easiest electric ever made.

IF YOU DON'T HAPPEN TO KNOW personally anyone who owns a Flanders electric, just note the license number of those you pass on the streets. You can't mistake the car—the one you have always said was the most beautiful electric.

NOTE THE LICENSE NUMBER and then call up the owner. Any Flanders owner will be delighted to talk about his (or her) electric even with a stranger.

ASK HIM (OR HER) about the car. Ask about cost of maintenance. Our records show it has cost less than eight dollars per car for replacement parts on all Flanders electrics in use.

ASK ABOUT SPEED—he'll tell you he can turn rings around his friends in their electrics.

ASK ABOUT MILEAGE—comparative mileage. He'll tell you he still has enough current left to tow his friends home when their higher-priced cars have exhausted their supply.

ASK HIM ABOUT SKIDDING—about control and those things that make for security and safety in a vehicle that is much driven by ladies.

ASK HIM ALSO what he knows about other electrics in hands of his friends—about relative first cost, cost of up-keep, of repairs of tires and especially of relative cost of battery replacement.

IF YOU DO THIS—and the more owners you ask the better—you will learn that despite the lower price of the Flanders, it out-runs and out-lives the others and that, still more surprisingly, when you try to buy one that has been used two or three years it is almost impossible to find an owner who will sell—and then you'll have to pay more for it than for cars that sold for \$1,000 more at the same time.

THAT'S A REMARKABLE FACT. And yet, if you will take time to study closely the construction—mechanically and electrically—of this Flanders and compare point for point with the others, you will find the reason. It is better made. Made of better materials and more accurately machined.

THE PRICE. That is easily explained. Better factory facilities and larger production. Made in its entirety in our own plant at Pontiac by an organization of experts. Selling cost is vastly less.

WHEN YOU TRY TO SELL any article for more than it's intrinsically worth, it costs heavily to sell it. Experience taught us that we could get \$1,000 more for this car—but it would cost \$5,000 more per car in dealers' discounts and other advertising and sales expense to do it. And the higher price would greatly curtail the demand—thus increasing the manufacturing cost.

THERE'S NO SECRET ABOUT IT. It is plain to any business man.

THE FLANDERS ISN'T A CHEAP CAR—in the sense that it is made cheaply. We claim there is no better car on earth. Can't find a better motor, controller, battery or tires. We pay more for springs, for frame, for axles. Meter (by the way the distant dial meter was also originated by the Flanders, now used by several).

NOW WE FIND THERE ARE A FEW misguided persons—victims of a false pride—who hesitate to buy a Flanders because the price is lower. Why not look at quality? Price is no criterion. And while four years ago there might have been some doubt in your mind as to whether a first-class electric could be made at the price, there is now no room for such doubt—for the proof is everywhere.

"I WOULDN'T TRADE MY FLANDERS for any other electric I ever saw," said a prominent Detroit lady recently. "I have watched the performance of other makes in hands of my friends for three years and I know mine will go farther on a charge, will go faster if I am so minded, and my maintenance bills are lower than those of any of my friends. In fact I have not had one repair in all the time I have used it—and only recently had to renew my batteries."

JUST FORGET PRICE while you investigate and compare quality. While you compare service. While you compare cost of upkeep. The deeper you look the more will you find in favor of the Flanders.

AND THEN STAND THEM SIDE BY SIDE—the Flanders and the latest model of any other—and you will find the greater reason for selecting the Flanders. It never will go out of style. It never will become obsolete. You will just be as proud to drive it ten years from now as when it was new.

BECAUSE IT IS TRUE COLONIAL in every line—and colonial carriage design, like Gothic in architecture, never can become obsolete or "unstylish" because it represents perfection and so cannot be improved upon.

A DEMONSTRATION IS A REVELATION—and you will be driving it yourself within fifteen minutes after you have entered the car.

Electric Incorporated

General Offices, Detroit, Michigan
100 Dodge Bldg., Jefferson Ave., Cor. Brush

National

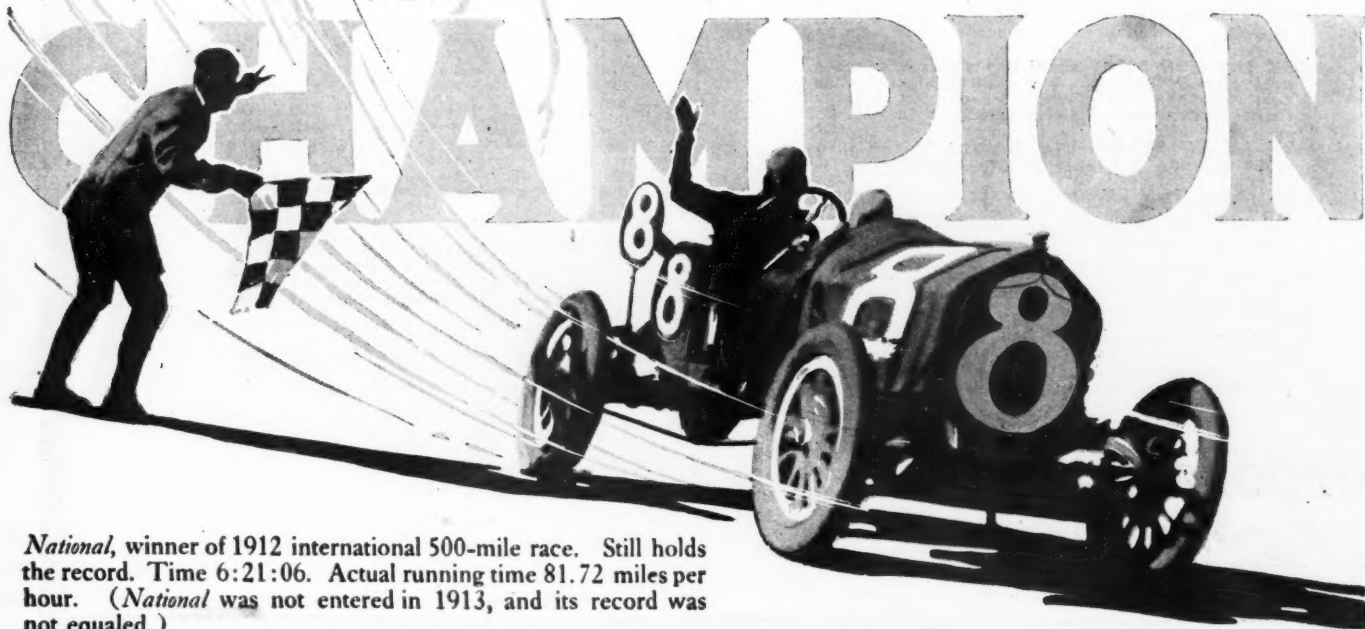


SIX \$2375

National's Racing Victories live forever in Your Car. You get the championship quality in Your Car that makes *National* Cars champions in all kinds of contests. Remember the *National* is still the World's Stock Car champion. Our racing success warrants your confidence.

Write for illustrated catalog

National Motor Vehicle Co., Indianapolis, Ind.

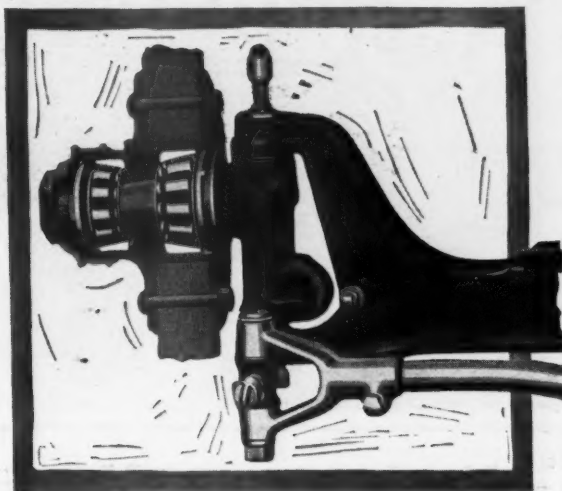


National, winner of 1912 international 500-mile race. Still holds the record. Time 6:21:06. Actual running time 81.72 miles per hour. (*National* was not entered in 1913, and its record was not equaled.)

When Writing to Advertisers, Please Mention Motor Age.

TIMKEN

TAPERED ROLLER BEARINGS



In the Front Wheels

MOTOR car engineers will tell you that the front wheels are the points of severest service for bearings. Of all places in the motor car where bearings are used you are most apt to find Timkens in the front wheels.

These two facts are connected in the relation of cause and effect.

Why are the centers of the front wheels the places where bearings get the hardest usage. Because, in addition to the weight they have to sustain and the shocks and vibrations, the front wheel bearings have to stand that severe outward end-pressure that comes when the front wheels change the direction of travel.

In turning a corner momentum tends to keep the car and its load on its original course. People riding in the car feel this force pushing them outward along the seat.

Straight roller and annular ball bearings have little ability to meet this end-thrust. So, if they

are used to sustain the car's weight, additional thrust bearings become necessary.

But the Timken Tapered Roller Bearing sustains both direct load and side pressure because its rollers are tapered and revolve between a tapered, two ribbed, cone and a tapered cup, as shown in the diagram.

Another reason Timken Bearings are so widely used in front wheels is that their tapered construction makes them adjustable for the slight wear that is bound to come with time in any bearings. And, in the front wheels it is most important to be able to prevent looseness and wobbling of the wheels by adjusting the bearings.

Other facts about bearings in general and about Timken Bearings in particular are told simply and non-technically in the Timken Primer No. T-1. It will be sent free, postpaid on request to Timken, Canton, Ohio.

*Timken Tapered
Roller Bearing*

vs.

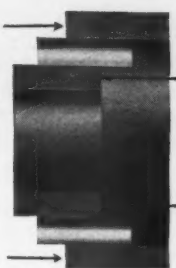
*Straight Roller
Bearing*

or

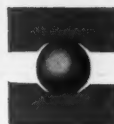
*Annular Ball
Bearing*



Arrows indicate end-thrust and the diagrams show why its tapered construction enables the Timken to meet this force, while the straight-roller bearing cannot.

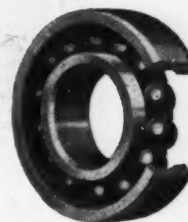


Vertical load capacity sufficient if the bearing is made big enough, but must be larger than a roller bearing of the same capacity.



End-thrust capacity practically none, hence additional thrust bearings are necessary.

Not adjustable; must be replaced when wear occurs.




 The advertisement is framed by a decorative border. The top half features a black and white illustration of a vintage car driving on a snowy, mountainous road. The word "Polarine" is written in a large, stylized script font across the top of the illustration, with "FRICTION REDUCING MOTOR OIL" in smaller capital letters underneath. The bottom half of the illustration shows a group of people, including children, standing in a wooded area.

Polarine

FRICTION REDUCING MOTOR OIL

**Nearly 300,000 Motorists
in the Middle West Alone Use Polarine**

That estimate is based on the sale, in ten States, of 5,918,098 gallons of Polarine during the past year. So many motorists experienced in the operation of all makes and types of motor cars, motor trucks and motor boats cannot be wrong about lubrication.

Polarine maintains the correct lubricating body at any motor speed or temperature and flows freely at zero.

Try it in *your* motor.

STANDARD OIL COMPANY
(AN INDIANA CORPORATION)
Makers of Lubricating Oils for Leading
Engineering and Industrial
Works of the
World


 A circular logo for Polarine, featuring a crown in the center and the words "Polarine" and "Standard Oil Company" around the perimeter.

The Detroit Electric Special

A Common-Sense Electric Car

\$2550

IN the Detroit Electric Special we have brought out the most common-sense electric car ever made—from the standpoint of general satisfaction, service and economy in the hands of the average owner. Such value has never before been offered at such a price—\$2550.

The Detroit Electric Special is a thoroughly sensible car in every way. It is moderate in first cost—in fact, the lowest priced high-grade electric ever put on the market. Light weight and perfect balance make it an excellent hill-climber and economical in battery and tire cost under all conditions of use.

This car has Detroit Electric quality in-built all the way through. In design and construction, in mechanical features and refinements, in beauty and luxury of appointments, this model measures up to the exacting Detroit Electric standard.

Sixteen optional trimmings are offered, hand-buffed leathers, broadcloths and imported whipcords.

This new Detroit Electric Special (Model 43) is so designed that it can accommodate four adults comfortably, with clear vision in every direction for the operator.

It is equipped with our 40-cell, 13-plate guaranteed lead battery (washing unnecessary); large tires, either cushion or pneumatic, our standard full aluminum body, aluminum roof, aluminum fenders; powerful Detroit Electric motor; our well known direct shaft drive (chainless); two distinct braking systems with automatic cut-out switch in connection with foot brake pedal.

This car is ideally simple to handle and absolutely safe in operation.

Write us for special information on this model.



Model 43—\$2550
Tire Equipment: Goodrich Cord
Pneumatic or Motz Cushion

THE
Detroit
ELECTRIC
SOCIETY'S TOWN CAR

Prices

With Bevel Gear Axle

4-passenger Brougham	
Rear seat drive.....	\$2550
5-passenger Brougham	
Front seat drive.....	2800

With Worm Gear Axle

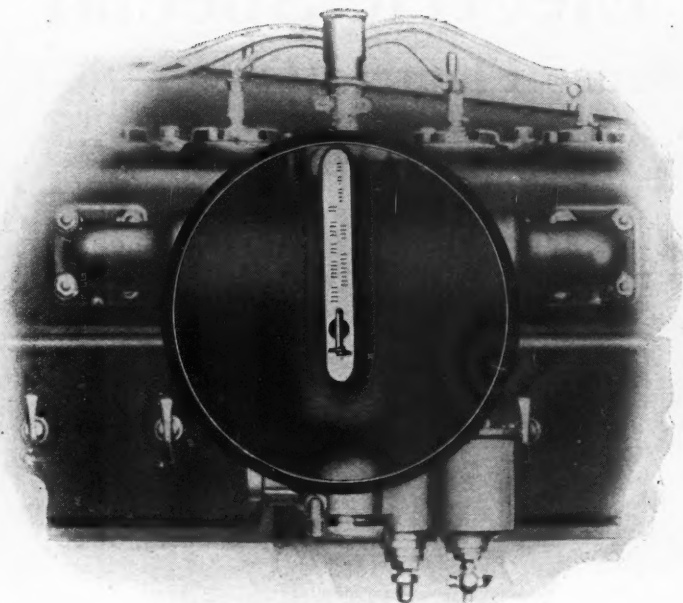
Gentleman's Roadster.....	\$2500
4-passenger Brougham	
Rear seat drive.....	2850
5-passenger Brougham	
Detroit Duplex Drive.....	3000

Anderson Electric Car Company, Detroit, Michigan

Builders of the Detroit Electric

World's Largest Manufacturers of Electric Pleasure Vehicles.

WIARD FAMOUS AUTOMATIC SPEEDLER



The Little Device for the Big Saving in Gasoline

If you paid \$150 for gasoline last year put a Wiard Speedler on your car and save \$50 this year. The Wiard positively cuts down gasoline consumption from 25 to 40% in the year's run. There are no moving parts to get out of order—nothing to work loose. The heat of the motor automatically operates it. Can be attached to 1, 4 or 6 cylinder motors.

\$4.00 Prepaid

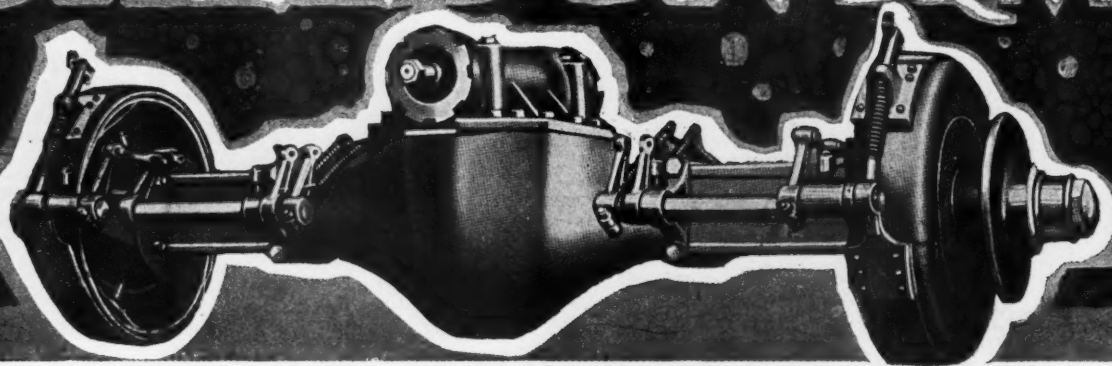
Satisfaction Guaranteed or Money Back at Once

WIARD AUTOMATIC AIR VALVE COMPANY

Distributors for Great Britain and the Continent:
THE YOUNG, SANDWITH SALES CO. London, England.

United States and Canada:
BRESLER-WALLACE SALES CO. 1031 Dime Bank, Detroit, Mich.

SHELDON WORM DRIVE



When you specify "SHELDON" you are not experimenting with experiments, but you get AXLES and SPRINGS with years of manufacturing experience back of them—Axles and Springs that are selected for important work where conditions make *reliability* supremely important.

SHELDON AXLE CO., Wilkes-Barre, Pa.

CHICAGO
Peoples Gas Bldg., 122 South Michigan Blvd.

SAN FRANCISCO
444 Market Street

DETROIT
1215 Woodward Avenue

Thousands and thousands of automobiles—both pleasure cars and trucks—follow the "Raybestos Road" to brake safety and economy.

More cars have been lined with Raybestos than with all other linings combined. It has proved its supremacy.

TRADE MARK
Raybestos
REG. U.S. PAT. OFF.

The ONLY Brake Lining with a Definite Guarantee

If Raybestos fails to last one full year from the date it is placed on the car, we will furnish new lining without charge. This guarantee applies to all types and weights of pleasure cars and to all light trucks.

The Raybestos record and the Raybestos guarantee are your protection. Why take chances with other linings not good enough to be guaranteed?

Insist on Raybestos. Look for the silver edges and the name on every foot.

THE ROYAL EQUIPMENT CO.

1352 Bostwick Avenue

BRIDGEPORT, CONN.



YOU Motorists—you speed fiends, pleasure riders and tourists—you who auto o'er rough roads and smooth. Are you fully acquainted with the

JOHNSON
SHOCK ABSORBER

A Resilient Cushion Between the Road and the Load

Did you know that no coil spring Shock Absorber except the Johnson is adjustable to all road and load conditions, and that the Johnson is so constructed that heavy shocks, as well as light ones, are absorbed?

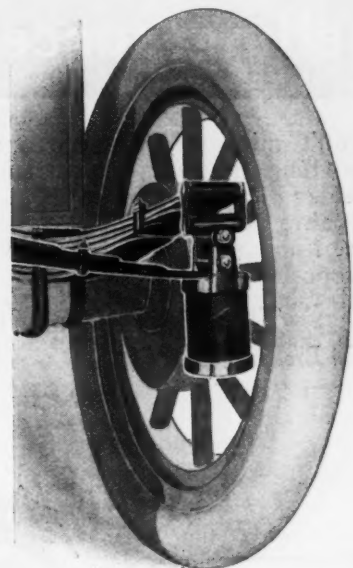
Did you know that they make motoring on rough roads the same as motoring on smooth roads?

—that eminent engineers attest to the reduction of road wear and tear of at least 33⅓% and of a consequent addition of one-third to the life of any car?

—that Johnsons prevent spring breakage, cut your repair bill and save tires?

These are facts no motorist can afford to overlook—and we ask the opportunity to prove our contention.

FREE PAMPHLET If you will just drop us a line, detailed information will be sent and we'll let you know the name of a dealer who will attach Johnson Shock Absorbers to your car **ON TRIAL**. Address the



Platform Type

TRIPLE ACTION SPRING COMPANY, 61-63-65-67 East 28th St. Chicago

ESTABLISHED 1906

THE ORIGINAL NEW DEPARTURE was laughed at by those who now aim to duplicate it

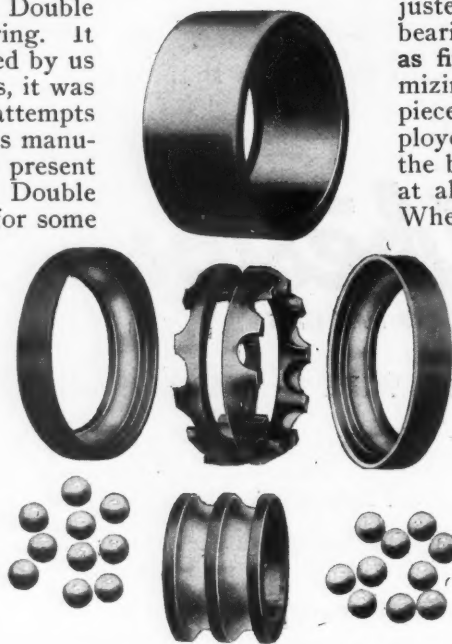
We are the originators of the Double Row radial and thrust ball bearing. It was the first bearing manufactured by us and, like all radical improvements, it was skeptically received at first, but attempts are now being made by numerous manufacturers to duplicate it. The present design of the New Departure Double Row has been in successful use for some years and its predominating features have been proved in actual service. These features are:

Greater radial load carrying capacity than any other bearing of any type.

Ability to resist severe and thrust stresses from any direction.

Ability to take both radial and thrust loads at the same moment without friction.

The combination in a single self contained, permanently ad-



justed, unit of a radial and thrust bearing successfully replacing as many as five bearing units, thereby economizing space and expense. A two-piece frictionless separator is employed, assuring proper alignment of the balls in their true path of rotation at all times.

When one row of balls rotates faster than the other, as sometimes occurs in double row bearings, the New Departure ball spacing system prevents cramping and distortion of the separator, which eventually results in breakage, disalignment, and destruction of the bearing.

New Departures are guaranteed for quality of materials and accuracy of manufacture and finish.

Catalog of New Departure Double Row, Single Row and Radax Ball Bearings on request.

THE NEW DEPARTURE MANUFACTURING COMPANY

Western Branch, 1016-17 Ford Bldg., Detroit, Mich.

BRISTOL, CONN.

1400 Campbell Agents
testify to the great
selling success of —

"CAMPBELL"
ACCESSORIES
Waterproof
Seat Covers

Don't miss this chance to make big money handling the best selling line in the accessory field. Generous profit. No "comebacks," no repairs, no replacements. Stock covers for all the leading makes of cars. Write today for our proposition.

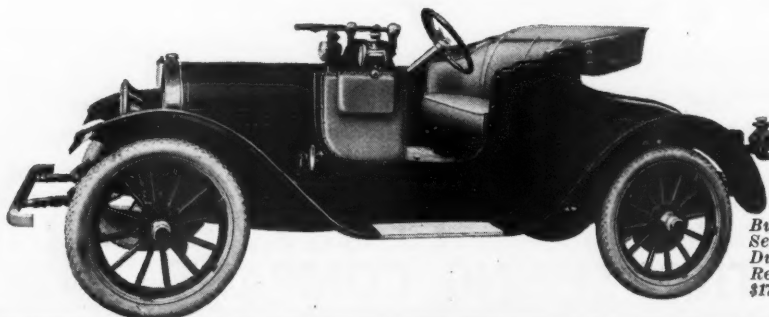
The Perkins-Campbell Company
624 Broadway Cincinnati, Ohio

Automobile Owners, Read!

Nothing improves the looks of your car like Campbell water-proof seat covers. Saves new upholstery—makes old cars look new. Cool, comfortable, easily cleaned. Three grades.

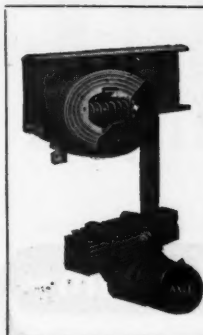
Write for Samples and Prices

Get the
Campbell
Agency



Buick 36—
Seat Covers and
Dust Hood,
Retail Price,
\$17.00

The Snubber Principle Is Entirely Different from that of any other shock-preventing device



When springs compress, the slack belting is drawn into the coil. When springs commence to expand the alternate layers of belting and brass friction band tighten up in proportion to severity of rebound. This friction is what retards the up-movement.

GABRIEL SNUBBERS

\$15, \$20, \$25, per set of Four.
Two front, two rear. Half that per pair.

The above small type shows how Snubbers "take hold" to prevent jolts and jars when the going is rough, but do not interfere with full spring resiliency on smoother roads. Also why they make your car ride as easily with ONE occupant as with SEVERAL.

Standard Equipment on the Easiest-Riding Cars—

White, Peerless, Stearns, Oldsmobile and Lozier. Partial or special equipment on more than twenty other leaders. All leading Automobile Engineers have tested them out and know their merits.—ASK THE ENGINEERING DEPARTMENT OF YOUR CAR.

Snubbers are even more necessary on smaller cars because of the abrupt and snappy rebound that goes with short wheelbase and less expensive springs.

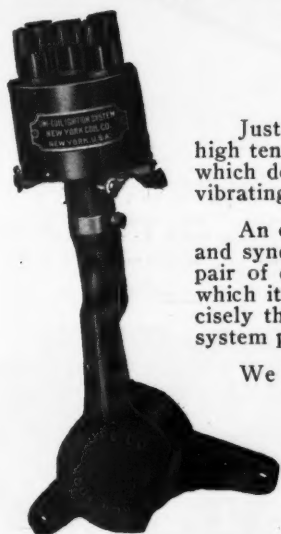
Tell us name and model of your car and let us send booklet and prices.

Gabriel Horn Mfg. Co. 1415 E. 40th St., Cleveland, Ohio

—Important Announcement—

What all Ford Owners Have Been Waiting For—The Uni-Coil Ignition System for Ford Cars.
Operated by the Ford Fly Wheel Magneto or Battery at the Remarkably Low Price of

\$15.00 Complete



Just consider what this means to you—an ignition system fully equal in workmanship to the best high tension magneto especially designed to operate on the Ford fly wheel magneto or battery current, which does away with your inaccessible timer and the impossible problem of perfectly adjusting four vibrating coils.

An elevating gear bracket carries our special device, which is a combination of timer, distributor, and synchronizer. It contains a circuit operating mechanism of extreme simplicity, which causes one pair of contacts to time or synchronize the magneto or battery current to a single coil unit from which it is delivered by means of the high tension distributor direct to the four spark plugs, in precisely the same manner as a magneto; in short, the most satisfactory, long lasting and best adapted system possible to secure for a Ford car.

We furnish the outfit complete; you do not have to drill a hole or even furnish a screw.

This is your opportunity to equip your car with a high grade, dependable ignition system made and guaranteed by a thoroughly reliable firm of long experience.

Do not forget that we manufacture the famous Model "T" and Senior Master Vibrators; also the "NYCO" Accelerator (with foot pedal or steering post control) and the "NYCO" Two System Switch.

New York Coil Company, 338 Pearl St., New York, N.Y.

WESTERN BRANCH, 1429 Michigan Ave., Chicago, Ill.

Here is big, profitable
business for you—
equip every customer's
car with

VELVET SHOCK ABSORBERS

Now is the time to get the exclusive agency for Velvet Shock Absorbers. Every set of Velvets sold helps sell another set—and there's a nice big profit in Velvets for you.

They are the original, successful Cushion Type Shock Absorbers. Can be attached to all cars having three-quarter elliptic, scroll-end or platform springs in rear, and nearly all other cars. Require no boring or special fittings and can be installed in a few minutes.

Velvets, the quality absorbers, prevent breakage of springs—save tires and life of engine and body—absorb all vibrations and shocks—make car ride easy and comfortable.

10 Days' Free Trial

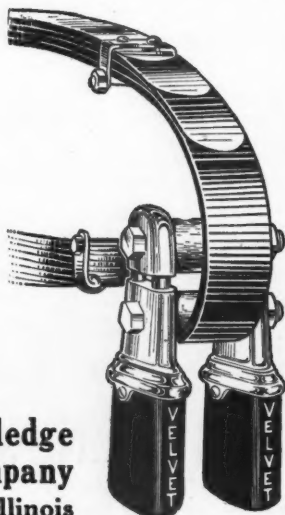
You can sell Velvets on 10 days free trial with our guarantee that if they don't give satisfaction money will be refunded.

Write Today for Special Dealers' Proposition

Don't delay—write now for Special Dealers' Proposition—get the shock absorber business in your territory.

Don't let your competitor beat you to it—so write today.

**The John W. Blackledge
Manufacturing Company**
Dept. B Chicago, Illinois



Don't Ride In On the Rim—

Don't rimcut a \$40 tire simply because it is easier to find a "free air" garage than it is to play jumping-jack over a hand-pump.

Every yard you travel on a flat tire you are paying for a MAYO Spark Plug Pump, whether you realize it or not

Carry a MAYO Pump in your tool-kit and you will have no dread of tire inflation. You can let your motor pump your tires. And the motor and the MAYO will do the work 5 times faster than you can by hand.



Simply to Avoid This When—

With a MAYO you can take it easy on the running-board, or under a shade tree along the road. No exertion—no perspiration—no blisters—no backache!

When it comes to a soft tire, you will find it much more economical to spend minutes with a MAYO Pump than to spend \$4.00 later with the tire repairman.

Complete with Gauge, 12 ft. Hose, all Connections, \$10.00.

Mayo Quick Detachable Spark Plug, \$1.50 Extra

You May Try a Mayo Pump Free on Your Car for 30 Days. Write Us.

MAYO MFG. COMPANY
55 East 18th St. CHICAGO, ILL.



**You Can Save Both
Tire and Back This Way!**

"Scale" Destroys Engine Power!

"Scale" Coats the Walls of the radiator, water jackets and connections. It comes out of the water, no matter what water you use or where you get it.

"Scale" is a Non-Conductor of Heat. It forces the heat to stay in the engine. It causes overheating because the cooling system fails to do its work.

When an Engine Overheats, carbon rapidly forms in the cylinders; then that carbon causes the engine to overheat. It costs you money to remove carbon and money for repairs if you do not remove it.

If "Scale" is Kept Out of your cooling system, so that it can do its work, you will never have any serious trouble with your engine or cooling system.



Makes a Cooling System be Good

Radiatol Removes All "Scale" from old water cooled cars and prevents it in new ones, because it stops the chemical action which forms "scale."

Radiatol Does Its Work Quickly and surely because it is powerful, but it is absolutely harmless to use.

Radiatol is Guaranteed to Do as We Say or your money back on your say so. If your dealer does not sell Radiatol, send \$1.00 for a trial package which we will send prepaid by parcel post.

Dealers: Radiatol saves money for the car owner; its sale means money for you. Write for our dealer proposition.

Wills Chemical Co.

Department C

Wheeling

West Virginia

The Coming Horn!



Get in
on a
Really Big
Proposition!

In every section of the United States—within the next 60 days—some one man—or concern—is going to be granted *exclusive selling rights* for the RED DEVIL HORN.

If he is a live wire—and he'll have to be—he'll find it a mint. This is the livest auto accessory proposition ever sprung on the public.

Everything is *right* about the RED DEVIL—price, design, materials and guarantee—it has selling points that no other horn ever made could truthfully claim. No upkeep cost—price is but \$5, \$6, \$7, according to size—within the reach of every motor car owner in your territory.



Red Devil Horns

You'll Soon Hear the "Friendly Warning"—Everywhere!

Now is the time to get in on the ground floor! And we have worked out a fair and square territory agreement that is bound to make a hit with every man who is on the level and willing to hustle for profits.

You Don't Need to Tie Up a Bunch of Money in Territory Contracts

Simply pay for the horns as you need them, in small allotments—every horn accompanied by the factory guarantee of complete satisfaction or money back.

WRITE NOW—don't delay a day or you may be too late.

Standard Motor Parts Mfg. Co.

Room 503, 1200 Chestnut St., Philadelphia, Pa.

**NO
MAN
IS
RICH
ENOUGH**

to afford
a cheap
Plug in
his motor.
A poor
spark
requires
a richer
mixture
and more
gasoline.
Cheap
Plugs,
with their
cracking
Porcelains
or oil-
soaked
mica, lose
half the
current.



**MILLIONS
ARE
SPENT
TO
ADVERTISE
PLUGS**

The
millions
of de-
lighted
users
of the
HERZ
PLUG
are our
adver-
tisement

Buy HERZ PLUGS

They will prove the best investment of your
life, one that will bear rich interest in
Smaller Gasoline Bills

ASK YOUR DEALER

HERZ & CO., 245 W. 55th Street (Just off Broadway.) New York

Get what your engine owes you!



Your power unit can't "produce" if handicapped. You can't run on dry gears and still get the benefit of the full rating of your engine. There's more in correct lubrication than you may think. Give your engine a chance—

Use BADGER Gear Compound

It's "Always on the Teeth"

Stays where you put it. Never runs thin, never packs on the sides of the gear case. Every ounce lubricates. Not only conserves your power but is an effective help for noisy transmissions and rear axles. One can make you an enthusiast for all time.

We also make F. V. Motor Oil and Badger Lubricants. See your dealer or write us.

Dealers Write for Territory

Wadhams Oil Co., Milwaukee, Wis.

Coast Distributor: Wadhams Oil Company of Washington, Seattle, Wash., and Vancouver, B. C.



Starting - Lighting - Ignition

REMY

Apparatus & Organization of Constant Service

A FACT!
Equipment and Service Gives
Motor Cars Their

REPUTATION

REMY

"Standard of the World"

Starting - Lighting - Ignition

A Service Station in Every Motorina Center.

REMY ELECTRIC COMPANY

Laboratories-Factories-General Offices

Anderson Indiana

BRANCHES

New York Detroit Kansas City Minneapolis Boston
Chicago San Francisco

How You Can Help



*"A continuous, improved highway from the
Atlantic to the Pacific"*

Do you want to be one of that great army of progressive patriots who are helping to build a greater, more beautiful and more prosperous America?

Do you want to join with a million other practical dreamers, in the pushing through of an unselfish work which means more business, more pleasure, more education and more advantages to all?

Do you want to help in the building of an eternal monument to the greatest name in the history of our country, to the greatest man the nineteenth century produced—Abraham Lincoln? If you do, join the Lincoln Highway Association.

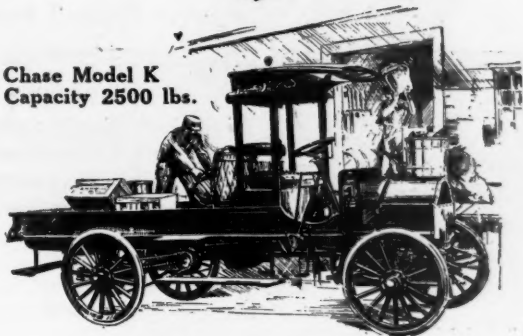
It's a great organization—a grand work to feel in sympathy with—costs but \$5.00, payable once. Get out your check book now—here's a chance for you to build a portion of an eternal monument, the longest improved road in the world.

Send the five to

The Lincoln Highway Association
Dime Bank Bldg., Detroit, Mich.

We have a set of Lincoln Highway pennants for your car, which will come to you for a dollar, prepaid. All the real Lincoln Highway boosters are wearing a little red, white and blue lapel button—they're twenty-five cents. Wear one.

Chase Model K
Capacity 2500 lbs.



Get Them— Get Those "Hard Buyers"

AND, along with them, get the ordinary fellows who are in the market for trucks.

When you find how easy it is to sell a Chase Truck to a "hard buyer" you realize, too, that the ordinary truck "prospect" is even more easily brought in "out of the wet."

The "Hard Buyer" Evidence That Clinches

You can show any prospect just how Chase Trucks are making good under conditions that practically duplicate his own. The Chase Dealer Book of Owners' Experience puts it over more strongly than a *talked* argument. It is *facts and figures*. It is the *proof* of what the owners of 3600 Chase Trucks are *saving* over other transportation means.

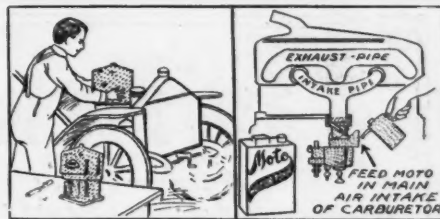
There is still some *interesting open territory* for Chase representation. Write us for information. Address Dept. 5.

Chase Motor Truck Co.,

Syracuse, N. Y.

CHASE MOTOR TRUCKS

**Don't take
Engine Down
to Remove
Carbon—Use
Moto Motor
Tonic**



**You Men Who Own Automobiles Have a
New Joy Coming**

Moto
MOTOR TONIC

YOU can remove the carbon from your engine anywhere, as good as a repair shop can do—and for 37½ cents. One gallon of MOTO MOTOR TONIC will do your engine more good than \$25.00 spent for scraping, and will practically double the life of any Motor.

HOW MOTO MOTOR TONIC IS USED

In giving your engine the first dose and where carbon is well accumulated, start the engine and run until hot, shut engine down and pour about one-eighth pint in each cylinder, where it can get action to the pistons, rings and valves. Leave the engine set over night or at least three hours. After this time, start engine up and the carbon will pass off through the exhaust. The compression and energy of the engine will develop and you will be surprised at the power and results.

USE MOTO MOTOR TONIC ABOUT EVERY 500 MILES. After once cleaning engine in the above manner, about every two weeks feed MOTO MOTOR TONIC to the engine by placing about one-half pint of the Tonic in an ordinary oil can and let it pass in the air intake of carburetor while the engine is running; it will suck into the engine and will be sufficient to keep rings and valves clean and to keep carbon from forming. This dissolvent contains no injurious acids. It is in itself a lubricator and can do no harm.

MOTO MOTOR TONIC is sold to you with the distinct understanding that **YOU GET YOUR MONEY BACK** if not delighted. There's no string to that—no come-back—no evasion—no argument. It is so good it CAN STAND A GUARANTEE LIKE THIS.

PRICE OF MOTO MOTOR TONIC:

PRICE, per quart can.....	\$1.00
Price, per ½ gallon can.....	1.75
Price, per 1 gallon can.....	3.00

MOTO MOTOR TONIC CO., Dept. G. Wichita, Kans.

THE GREAT RIGHT WAY TO STOP RADIATOR LEAKS.

Pour it in ~ now.
Finds the leak and
fixes it in 15
minutes.



Carry it in your car. It is always ready for use. No removing of radiator. No searching for trouble with torch and solder. SE-MENT-OL dissolves in the water. In passing thru the leak the cool air congeals it into a cement that effectually closes the cavity. Drain and refill radiator with fresh water.

It's A Cinch. Ask Your Dealer.

By the makers of CARBONOL which removes carbon at five cents a cylinder.

This SPRING, GINGER UP YOUR MOTOR WITH



Start the motoring season *right!* Don't put up with a "feeble" motor this year as you did last. A motor that won't climb hills, that loses its "drive" in the sand and mud, nine times in ten is troubled with old-style leaky piston rings which won't hold compression.

It is mechanically impossible for STA-TITE Piston Rings to lose compression. Put a set of STA-TITE Rings on a motor troubled with faulty compression and we'll *guarantee* them to increase power, decrease fuel consumption and minimize carbonization.

STA-TITE Rings enable a motor to develop its *full* rated horsepower—one reason for your telling your garageman to install a set this spring when you overhaul.

STA-TITE Rings are made in three pieces. All joints automatically seal when the ring is placed on the piston. Adapted to autos, motor boats, etc. Made of special processed gray iron. Can be attached to any piston head. Money refunded if not satisfied.

LIBERAL TERMS TO SUPPLY HOUSES AND REPAIR SHOPS

WRITE FOR LITERATURE

STA-TITE PACKING RING COMPANY

3034 Olive Street,

St. Louis, Mo.



Twitchell
Air Gauge
The New Positive Lock Stop

feature renders absolutely impossible the registration of any but the exact pressure in your tires.

Don't Guess

Tires inflated to forty pounds look and feel exactly like tires containing eighty. The only way to tell the exact air pressure in your tires is by means of a TWITCHELL gauge.

Price One Dollar
For Sale by Jobbers, Dealers and Garages, or

THE TWITCHELL GAUGE CO.
1201 MICHIGAN AVE., CHICAGO.



"Rist-Fit" — "Grip-Tite"
"Ventilated Back"—three exclusive Grinnell features

Any one of these features puts Grinnell Motoring Gloves in a class by themselves. And all three assure you the finest and most distinctive gloves you can buy.

Style 4020

Grinnell-Gloves

Best for Every Purpose

are of the very highest quality. We have been making them for 58 years—of finest selected Reindeer and Coltskin—soft as velvet, wears like iron. They are washable in soap and water or gasoline—dry like new. And only in Grinnell Gloves do you get Grinnell "Rist-Fit," "Grip-Tite" and "Ventilated Back."

Ask your dealer for Grinnell Gloves. If he does not carry them, send us his name and your size. We will send your selection on approval. Handsomely illustrated booklet with samples of leather on request.

Morrison-Ricker Manufacturing Co.
(Established 1856) 64 Broad St., Grinnell, Iowa
San Francisco Chicago Newark

Here's Long Life to Your Tires!



That's a toast that appeals to every automobilist. Tire troubles are the worst troubles you have with your car.

Do you know that three-fourths of them are due to under inflation? That's why the Brown Impulse Tire Pump means long life to tires.

The gauge, included as part of the regular equipment of every Brown Impulse Pump, insures exactly the right pressure.

The Brown

Is the Handiest Pump to Use

Because it is the only pump of its kind that attaches and detaches without a wrench. The Brown Q. D. Spark Plug lifts out, the pump drops in. No wrench, no fuss, no trouble, no broken plugs.

A pump and air hose do not make a complete inflating outfit. You need a gauge. We furnish it. You should not struggle and break spark plugs in attaching your pump. The Brown Q. D. Spark Plug makes this unnecessary.

Price, complete, including plug, tire gauge and 12 feet of air hose.....\$15.00
Extra Plugs 1.00
Previous models made over to fit the new connection 1.50

If you want to insure your comfort and economy this year, ask your dealer or write us about the Brown Inflating Outfit.

THE BROWN COMPANY
120 Bellevue, Syracuse, N. Y.

Every Automobile and Garage Owner or Operator

should possess a reliable, durable, convenient Electrical Measuring Instrument



WESTON MODEL 280
Portable Testing Instrument

Weston Miniature Precision Ammeters and Voltmeters

FIT THE POCKET

and are in every way the most accurate, durable, reliable and altogether satisfactory for testing batteries and electrical circuits

Send for 30-page bulletin No. 8 describing these and other small instruments.

Weston Electrical Instrument Co.
NEWARK, N. J.

New York	Boston	Denver	Birmingham	Paris
Philadelphia	San Francisco	Cleveland	Toronto	Montreal
Chicago	St. Louis	Detroit	London	Berlin

Gibson Quality Batteries

When you select a battery to sell to your trade, it is to your advantage to get one that will give the utmost satisfaction to the user—to insure you a repeat customer.

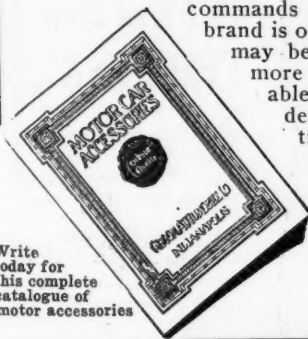
Gibson Quality Dry Batteries combine every essential demanded by the dealer and the motorist. Competitive tests prove Gibson Quality batteries to be superior in high amperage, quick recuperation and long life.

These batteries are sold at a price that commands attention. No matter what brand is offered you, or what the price may be, it is impossible to find a more dependable or a more salable Dry Cell. We offer the dealer a most attractive contract proposition—it's really a money-maker for YOU.

Write today—SURE.

Gibson Automobile Co.
232 Automobile Row
INDIANAPOLIS

Write today for this complete catalogue of motor accessories



The AERMORE Exhaust Horn

"A gentleman is coming." That's the thought called forth by the harmonious and commanding melody of the Aermore Exhaust Horn.

It has four perfectly blended notes that can be modulated from a low musical chime to a crashing burst of harmony that cuts through traffic sounds like a hot knife through butter, and always gains response and respect.

It does not clog, and has no movable parts to get out of order. An Aermore will give you a satisfactory signal for the life of your car without one cent of expense for upkeep.

The prices range from \$5.50 to \$10.00. Made to fit all cars.

Write for our catalog. We have a free horn proposition for dealers.

The Fulton Company

724-726 National Avenue
MILWAUKEE WISCONSIN



The "Hassler"

FORD

Shock Absorber

Different from all others, and many times better. Thousands in use. Many Ford dealers are now using the "Hassler" exclusively. Attractive proposition to Special Agents with demonstrating cars in unoccupied territory.

Robert H. Hassler
W. Tenth and Canal Sts.
Indianapolis, Ind.



SPLITDORF MAGNETOS—low and high tension—are made in a wide range of models for all manner of work and they'll give your motor more power—make your motor run smoother and quieter than will any other make, and, equipped with one, you can always start your engine on a quarter turn.

We'll exchange your present magneto of any make on a liberal allowance basis for an up-to-the-minute **SPLITDORF** low or high tension.

SPLITDORF PLUGS are not experimental—they are standard. Known since their first appearance as the "common sense plug" they are exactly that—no more and no less. **SPLITDORF PLUGS** will outlast your motor—thousands are rarely removed from a cylinder head. There is nothing fanciful about them—they are made to endure any and every strain of ignition put upon them.

SPLITDORF ELECTRICAL CO.

98 Warren Street

NEWARK, N. J.



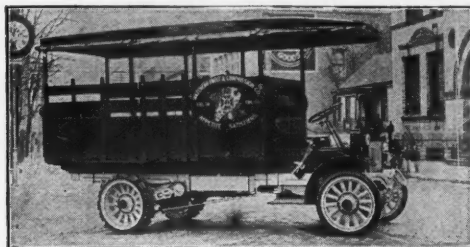
**THE
Kemco**
FAN TYPE
GENERATOR

The only generator which can be attached to cars now in service without excessive expense for installing.

You can put it on your car. First cost—the only cost. (17)

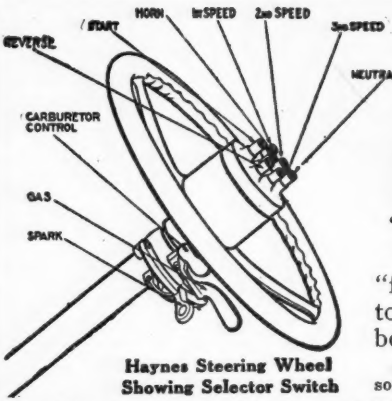
The Kemco Electric Mfg. Co.
CLEVELAND, OHIO

B.F. Grammm's Trucks



"Built to Be Used"

The Gramm-Bernstein Co., Dept. 9, Lima, Ohio, U. S. A.



Electricity Shifts the Gears on the
HAYNES
"America's First Car"

Two "sixes" and a "four." Roadsters, touring and enclosed body cars.

Haynes Steering Wheel Showing Selector Switch

Catalog covering this season's models upon request.

The Haynes Automobile Co., 2 Main St., Kokomo, Ind.



A box of assorted

RAJAH TERMINALS

for garages, in sizes and styles mostly used. Terminals exchanged if desired

RAJAH AUTO-SUPPLY CO.
Bloomfield, New Jersey
John Millen & Son, Limited,
Montreal, Toronto, Vancouver,
Winnipeg.

Safety and service—the two most important tire requirements—find their highest development in

PENNSYLVANIA Oilproof VACUUM CUP TIRES

Oilproof — Skid-Safe — Guaranteed For 4,500 Miles

Pennsylvania Rubber Co.
Jeannette Pennsylvania

Offices in All Principal Cities

An Independent Company With an Independent Selling Policy

WINTON SIX

The Fashion Plate

You can safely buy a Winton Six, for it is now in its seventh year of success—a thing impossible if it hadn't been right; made by the company that founded the industry, and the first in the world to concentrate upon six-cylinder cars exclusively. The newest model is one of remarkable beauty and excellence—the automobile fashion plate. Send for 64-page catalog.

The Winton Motor Car Co.

424 Berea Road, Cleveland, O.

WORLD'S FIRST MAKER OF SIXES EXCLUSIVELY



It bears the stamp of approval of America's best car manufacturers.

STROMBERG CARBURETOR

"The Accepted Standard"

This spring start the motoring season right. Get our 30 day free trial offer. Write us.

STROMBERG MOTOR DEVICES CO.
54 E. 25th ST. CHICAGO, ILL.






**THE
STAR**

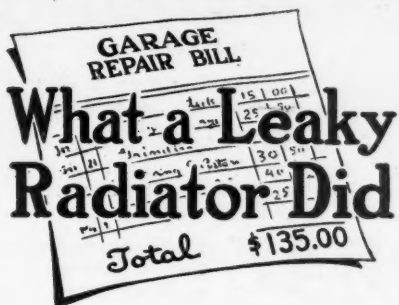


COMPLETE THRUST BEARING

The Star Ball Retainer Co.

Lancaster, Pa., U.S.A.

Manufacturers of Radial Ball Retainers, Thrust Ball Retainers, Complete Thrust Bearings



Cylinders scored. Bearings burned. A costly motor badly damaged. The same thing may happen to any car tomorrow—unless equipped with a

BOYCE MOTOMETER

Its warning signal reveals dangerous conditions long before the driver could possibly be aware of them.

Advertised in leading publications. Regular equipment for 1914 on Mercer, Pilot and Henderson "Six." Big sale to car owners. Easily attached to radiator cap of any car, where it is easily read from the driver's seat.

Some Valuable Exclusive Territory Still Open

We allow you to give 30 days' free trial on the Motometer. Two models—prices (retail) \$10 and \$5. Liberal discount to our dealers. Write now for terms.

The Motometer Company
1790 Broadway, New York City



Acme Torsion Springs



GUARANTEED TO MAKE YOUR FORD

The Easiest Riding Car in the World
Could we make a stronger guarantee? And notice it is not a mere claim—it is a positive guarantee.

WHY? Because ACME TORSION SPRINGS are based on SCIENTIFIC PRINCIPLES, properly applied. ACME TORSION SPRINGS, the only practical device on the market that can act FREE with, and CONTINUOUSLY IN CONJUNCTION with the LEAF SPRINGS, any way they are called upon to work, and adjust themselves MECHANICALLY to all conditions.

We Challenge Contradiction of Our Claims Get an Expert's Opinion

[Equip your car with ACME TORSION SPRINGS]

Insurance for life of occupants, car and easy riding. Don't be fooled by "shock absorbers." What you want is more spring capacity under proper Automatic Control. Acme Torsion Springs add at least 18 feet to the total leaf spring area, every inch adding greater resiliency automatically controlled.

Acme Torsion Springs stop vibration, prevent spring crystallization and breakage, minimize tire and engine trouble, and improve the riding qualities of any car at least 100%. They cost less than half the price of shock absorbers, and are worth several times as much. Eliminate Vibration and you eliminate trouble. We have convinced thousands, let us convince you.

N.B.—Acme Torsion Spring Equipment is fully Guaranteed against Defects and Breakage for the life of the car.

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WARNING!

Acme Torsion Springs are covered by letters of patent, and we have the sole and exclusive right to manufacture, use and sell the same. Take warning that our interests will be protected.

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"It's an absolute impossibility to 'open up' a plant and immediately deliver efficient gear assemblies.

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"And listen, what is more, we've been pleasing them in every particular.

"Is there any better proof of a product's merit than one hundred per cent of satisfied customers?

"Looks as if we ought to be able to please you too."

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A Remarkable Device!

The McCormick Power Plug

(Replaces the Spark Plug)



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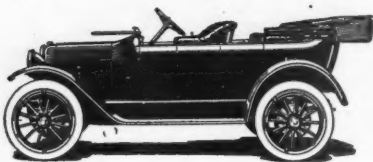
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32 H. P.
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MANUFACTURED SINCE 1901 FOR HIGH GRADE
AUTOMOBILES AND TRUCKS

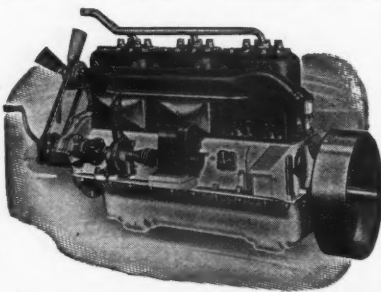
3 1/4 x 5 1/4 four and six cyl.
4 1/4 x 5 1/4 four cylinder
Standard or Unit
and

4 x 4 and 4 1/4 x 5 1/4 stand-
ard types, all L head, 4
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Manufacturers are invited
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Marion, Indiana



THE CROWE MASTER VIBRATOR — A BOON TO FORD OWNERS

Ends all vibrator troubles permanently. Produces a quick, hot spark, always uniform—no missing or late sparks. Takes the "jump" and "jerk" out of your machine; increases its power; economizes fuel; makes your engine start easier, pull steadier, run smoother, develop more power.

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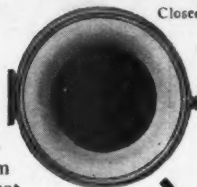
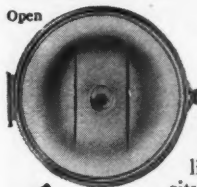
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This simple electric attachment, controlled by a push button, changes your lamps instantly from full searchlights to perfect broad beam city driving lights without that dazzle which the law forbids.

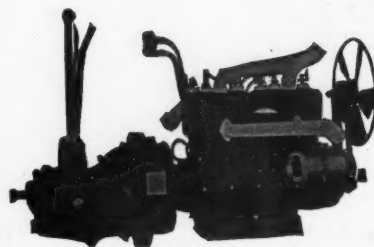
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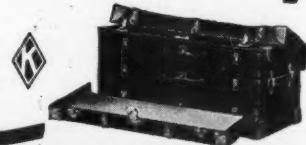
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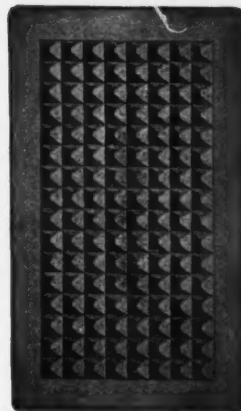
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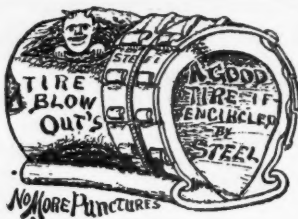
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PINCHED TUBE—BLOW-OFFS

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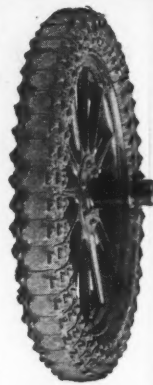
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At last the pneumatic tire problem has been virtually solved—the weak points in previous tire construction have been eliminated. The resiliency of a Bricton Pneumatic Tire puts it in a class by itself. It is Puncture-proof — Blowout-proof — Skid-proof — Rut-proof — Rim-cut proof — Oil-proof and Gasoline-proof.

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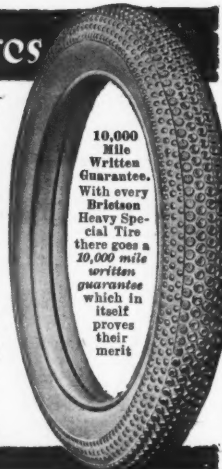
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Your Tires Can Be Made Like This →



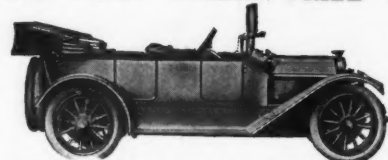
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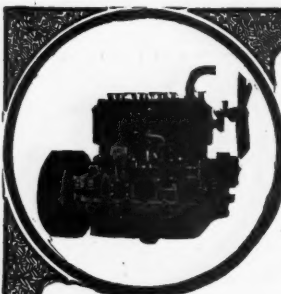


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A close-coupled five-passenger touring car suitable for long distance work, where speed and comfort are demanded.

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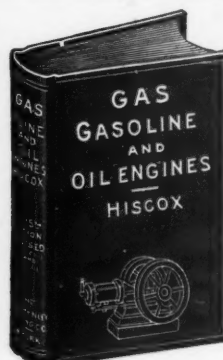
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The satisfaction of one accident averted will repay you many times over for the small cost of the CHANEY. The CHANEY dims the glare of the most powerful lights.



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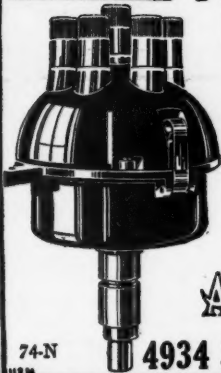
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For every kind and make of motor. A system ideal in efficiency, simplicity, and reliability.

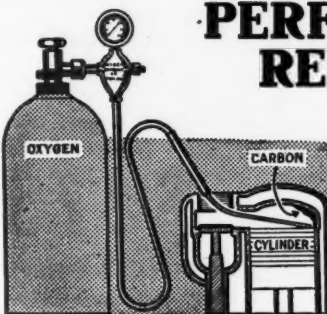
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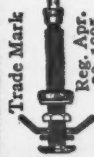
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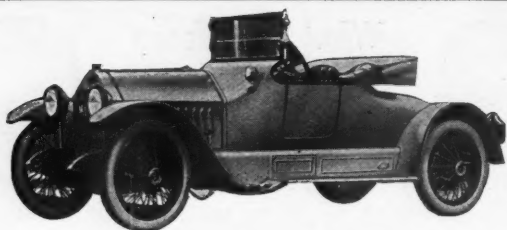
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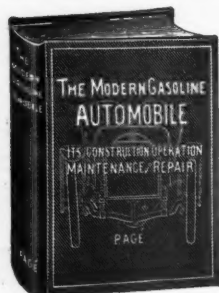
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WANTED—POSITION AS CHAUFFEUR and repair man; familiar with Franklin, Packard, Thomas, Pierce, Stoddard, Dayton, Chalmers, Studebaker, Oakland, Overland and Ford cars; 8 years' practical experience; married; age 30 years; want a change. H. H., 428 8th street, Niagara Falls, N. Y.

A SUCCESSFUL SALESMAN—EXPERI-enced in retail and wholesale automobile work, establishing agencies, organizing territory. Considered by many people a careful and expert driver. Prefer salary and commission. Experienced ad writer, can write follow-up sales letters that bring business; 28 years old; married; no children; no bad habits. Can furnish satisfactory references. Desire to change location. Now connected with largest distributor in middle west. Address Box E 109, care Motor Age.

POSITION WANTED AS CHAUFFEUR, 8 years' experi.; 32 yrs old; married; German-American; do own repairs; careful driver; never had accident. Box E 107, c/o Motor Age.

POSITION WANTED BY EXPERT AUTO-mobile Mechanic. Had 3 years' experience. Sober and married. Can furnish good references. Box E 111, care Motor Age.

YOUNG MAN, 25, TECHNICAL SCHOOL education, four years' drafting and shop experience, desires position as salesman for auto parts or accessories; best references. Address Box E 112, care Motor Age.

Business Opportunities

FOR SALE—A FIRST-CLASS GARAGE and harness business combined; only one in good town; good reason for selling. Address Box 93, Frosser, Neb.

FOR SALE—GARAGE AND COMPLETELY equipped machine shop, building, ground and tools, for \$3,400; no trades. For particulars write Jos. Slagel, Fairbury, Ill.

FOR SALE—GARAGE IN CITY 10,000. Leading car agencies; machine shop fully equipped; also Ford agency; one other shop in city; large storing capacity. Address Box E 95, care Motor Age.

FOR SALE—ONE OF THE BEST LOCA-tions for Garage and Sales Room in Ohio. Building two story, 175x45, over 15,000 sq. ft. of floor space. Ford Agency, large Auto Livery and Accessory business; no better opportunity ever offered. Address Box E 101, c/o Motor Age, Chicago, Ill.

HAVE A GOOD PROPOSITION TO OFFER to some automobile manufacturer needing more room or additional capital and willing to move. Write promptly, giving details of your requirements and present business. Box E 104, care Motor Age.

WE HAVE AN OPENING FOR A COMPE-tent factory manager in moderate-sized plant making medium-priced automobiles. One having some capital to invest preferred. Address Box E 103, care Motor Age.

Miscellaneous

CYCLECAR, MOTOR, TRANSMISSION, wheels, axles, springs, steering, frames, tires, belts; new; \$150.00. Box 311, Fonda, Ia.

MOTOR AGE is read by more than 23,000 owners of motor cars, garages and repair shops, motor car dealers, etc., every week. These people read MOTOR AGE every week because they are intensely interested in motor cars—they read it to keep in touch with "what's what and who's who" in motordom. Do these 23,000 and more people read the Classified Advertisements? Please note the following:


Business Opportunity

YOU WILL PLEASE CANCEL OUR ORDER for classified ad of the 29th. The two insertions were enough. We sold the plant today, and MOTOR AGE did it. We ran the ad in four other publications and did not get as many inquiries from all four as we got from MOTOR AGE, and we are still getting replies.

Situation Wanted

KINDLY CHANGE MY ADDRESS FROM Odebolt, Iowa, to Jonesboro, Ark. It is a good thing for me that I did not have you run my ad for six weeks, as the two insertions got replies enough so I thought I would be broke buying postage to answer them. Have a good job here, obtained through the ad.

Can anything be more convincing that classified advertising in MOTOR AGE Pays?



ELEKTRA
ASBESTOS FRICTION
BRAKE LINING

**ON THE STEEPEST HILL
IT'S A FRIEND INDEED**

Good brakes? Certainly you need them! But brakes without the safest brake lining are like a car without tires—next to useless.

Don't use "any old" facing for your brakes. It's not good policy—to say nothing about the safety of your own life and the lives of your passengers.

Get ELEKTRA BRAKE LINING. It's the safest—whether you're going down Devil's Gulch or up Jacob's Ladder. ELEKTRA is made of selected asbestos chemically combined with an indestructible metal. It gives splendid wear and long service.

Get a sample with complete information.
Write for it—today.

F. L. Horton Manufacturing Company
Boston, Mass.



Ford Dealers

CHESTER DEMOUNTABLE RIMS are made especially for Ford Cars so that Ford owners can equip their cars with over-size tires without changing or altering the regular standard Ford wheels. A set of five (one for spare)

Chester Demountable Rims

complete with attachments, sells for \$25. These rims use 32x3 tires on all four wheels—over-size according to Ford tire equipment—therefore giving Ford cars more comfort and better tire mileage.



This is the most practical Ford improvement of the year. Write for catalog and dealers' discounts.

CHESTER DEMOUNTABLE RIM CO.
FALL RIVER, MASS.

5-9

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An absolutely water-proof tire case is secured by the patented watershed feature of the Allen Tire Case. Made of highest quality enamel duck, by expert workmen.

The ALLEN TIRE CASE

gives a perfect protection to the spare shoe. In all sizes and for all styles demountable rims and wire wheels.

Manufactured by the
ALLEN AUTO SPECIALTY CO.
1926 Broadway, New York
1627 Michigan Ave., Chicago

BILLINGS & SPENCER Display Sales-Board for Wrenches



It is some satisfaction to sell machine wrenches when the entire line is visible. This board is one of the BILLINGS AND SPENCER services to their dealers. There are others which will interest you.

Sell satisfaction-giving tools the convenient and profitable way.

BILLINGS AND SPENCER COMPANY
Hartford, Conn.

HB

Hess-Bright

D. W. F.

CARLO AUGUSTO DYNETO
WESTERN UNION CODEAUTOMOBILE ELECTRIC
LIGHTING & GASOLINE
MOTOR STARTING SYSTEMS**Dyneto**

ELECTRIC COMPANY

ELECTRICAL APPARATUS

FACTORY
AND
GENERAL OFFICE

Syracuse, N.Y.

March 11, 1914.

Hess-Bright Mfg. Co.,

Philadelphia, Pa.

Gentlemen:

We are pleased to enclose contract covering our requirements for Ball-Bearings for one year.

We have decided to use your Bearings after tests which have extended over a considerable period.

We expect to use your #302, - #303 and #304, and trust you will arrange to carry a good supply of these in stock, in order to take care of our requirements.

Very truly yours,

Dyneto Electric Company.

Per *W. Doman*

AED/G

Vice-Pres. & Ch. Eng.





A British Critic's Appreciation

THE world's most careful and severe motor car critics are forced to acknowledge the value and superiority of the Overland.

Though English authorities have always fought the "invasion" of the medium-priced American car, Overland worth has now convinced even the most skeptical of these critics. Below we reprint, in part, an article recently published in The London Illustrated News, written by W. Wittal, one of the most able motor authorities of the old world:—

"I have had occasion to become more closely acquainted with one American car—the Overland it is certainly exceedingly fine value for the money.

".... It has a big, able engine, three-speed gear box electric self-starter and lighting equipment,

magnificent brakes, most comfortable and roomy seating accommodations for five, hood, screen, lamps, speedometer, tools—everything complete, in fact, save the petrol to drive away with.

".... I found the car to run as well as it looks, which is saying a great deal. Quite fast on the level, silent, with a wonderfully good acceleration, and a fine hill-climber withal, I really do not see what more can be desired by the average motorist than the Overland will give. I am no particular friend of the low-priced American vehicle, but this Overland car is one which would convert the most determined opponent of the Transatlantic cars. In my analyses of American cars, I have invariably striven to hold the scales fairly, recognizing merit where merit is present. And certainly it is present in the Overland and that to a very remarkable degree."

The Overland is universally accepted as the leader of its class. It costs 30% less than other cars of like specifications.

Write for catalogues. Please address Dept. 46.

The Willys-Overland Company, Toledo, Ohio

Manufacturers of the famous Overland Delivery Wagons, Garford and Willys Utility Trucks. Full information on request

SPECIFICATIONS:

Electric head, side,
tail and dash lights
Storage battery
35-Horsepower motor

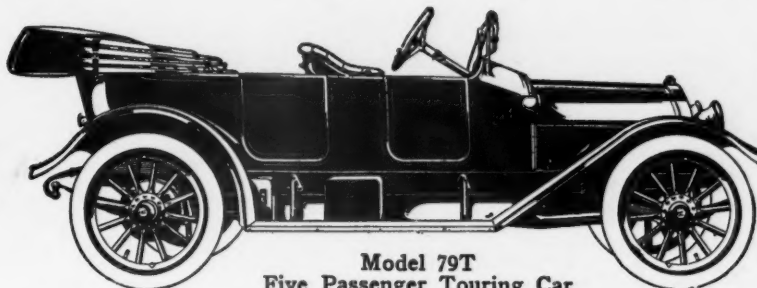
33 x 4 Q. D. tires
114-inch wheelbase
Mohair top, curtains
and boot

High-grade speedometer
Clear-vision, rain-
vision, windshield
Electric horn

\$950

Completely
Equipped

f. o. b. Toledo, O.



Model 79T
Five Passenger Touring Car

\$1075

With Electric
starter and
generator

f. o. b. Toledo, O.

Maxwell 25 \$750

Courteous Dealers Every-
where throughout the
United States.

Sell Maxwell Cars
The World's Leader
at \$750



The man in your town who sells MAXWELL cars will be pleased to know you, and pleased to tell you all about these cars without demanding that you buy one. MAXWELL dealers consider it a part of their duty to cheerfully distribute information as well as to sell cars. Their motto is "Service to the public" — and you are included.

If you care to see the largest, handsomest, most efficient, most completely equipped, and thoroughly well-built motor car ever sold for \$750, call on our dealer in your town.

MAXWELL MOTOR CO., Inc. DETROIT, MICH.